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CONTAINERS in common use

Fresh Fruits and Vegetables

FARMERS' BULLETIN 2013
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PRODUCTION AND MARKETING ADMINISTRATION

THE MOST NATURAL QUESTION concerning containers for fresh fruits and vegetables, and one often arising in one form or another is: What container is standard for a particular product, or in a particular section? For few products is there a definite, final answer to such a question.

Federal standards are in force for barrels and for the several types of baskets and hampers, but most fresh fruits and vegetables are shipped in crates and boxes and sacks—containers for which no such standards have been established.

These containers are used in a wide variety of sizes and shapes and impose an unnecessary burden upon the distributing trade, and hence upon the consumers and growers. The increasing costs of containers and packing and merchandising operations have focused attention on the problem.

It is generally believed that the principle of simplification could be applied to these containers to the immediate benefit of all parties concerned.

Without attempting to recommend one type of container over another, this bulletin sets forth under each commodity the containers most commonly used in the important shipping sections.

It is based upon material collected in a study of fresh fruit and vegetable containers made under the Research and Marketing Act of 1946; it supersedes and draws for material upon Farmers' Bulletin No. 1821, Containers for Fruits and Vegetables, published in 1939.

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CONTAINERS IN COMMON USE FOR FRESH FRUITS AND VEGETABLES

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INTRODUCTION

FOR many years in this country the average annual movement of fresh fruits and vegetables by rail and boat has approximated 1 million carloads, and an equivalent quantity is believed to move each

¹ Acknowledgment is made of the assistance rendered by the field representatives of the Fruit and Vegetable Branch, PMA, who supplied much of the specific information relating to the containers used in their own producing sections, and the cooperation of The Wooden Box Institute and members of the fruit and vegetable industry.

year by motortruck. Distribution data for a typical 12-month period indicate that each State contributes one or more products to this traffic, and at least 20 States contribute from 16 to 30 products. Conversely, no State appears to receive shipments from less than 8 other States, and half of the 48 States normally receive shipments from 25 to 40 States. Since the greater part of the produce involved in this great interchange is packed in some kind of container, which is usually the merchandising unit, the containers used in marketing fresh fruits and vegetables are of vital importance to the fresh fruit and vegetable industry and to the general public.

TYPES OR CLASSES OF CONTAINERS

The containers used for shipping fresh fruits and vegetables may be divided into four principal classes—(1) baskets, (2) crates and boxes, (3) barrels, and (4) sacks. A fifth class, drums, has a limited use. There are five types of baskets—(1) berry and till baskets, (2) hampers, (3) round stave baskets, (4) splint or market baskets, and

(5) Climax baskets.

Barrel construction is usually classified as stave or veneer; some barrels have wooden heads in both ends and others are closed at the top with cloth or burlap. Neither type is now extensively used for domestic shipments of fruits and vegetables.

The drum was at one time used for certain varieties of grapes packed

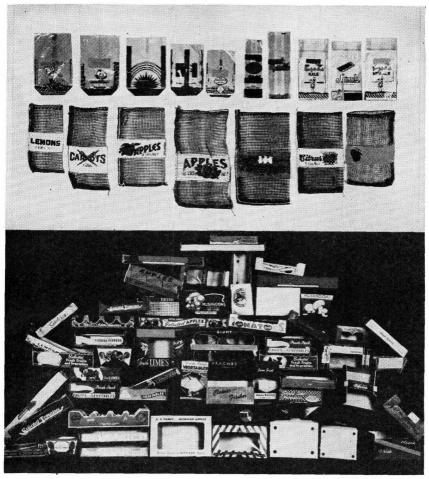
in sawdust, but it is now used chiefly for brussels sprouts.

Crates and boxes are grouped together because in the trade consistent distinction between them has not been preserved. Whether constructed of rotary-cut or sawn material, the ends, sides, tops, and bottoms may be solid, paneled, or slatted, in various combinations of single pieces and cleated units. Containers in this category are usually assembled with nails, but many crates are now bound together with encircling wires and closed with interlocking wire loops. A folding type, in which the sides and ends are interlocked at the corners and fold together when empty, is used to a limited extent. Corrugated and solid fiber boxes come in this group of rectilinear containers.

Sacks are generally made of burlap, but many are now made of cotton sheeting and of paper. For certain products, like onions, openmesh sacks, usually of cotton net or paper net, are now used almost exclusively, and this style is being used increasingly for other prod-

ucts, including apples, citrus fruits, cabbage, and green corn.

Within recent years another category of containers for fresh fruits and vegetables has become increasingly important, namely, consumer packages, varying in type, shape, size, and material, according to the nature of the product packaged. Except for certain products, such as potatoes, onions, citrus fruits, tomatoes, spinach, and, of course, berries, the prepackaging of fresh fruits and vegetables in consumer units is considered to be in the experimental stage, as efforts are being made to develop the type and size of package and the material best suited to the numerous kinds of produce believed to be susceptible to this method of merchandising (fig. 1).



PMA 17866 AND 17867

Figure 1.—Consumer packages. Upper, some of the varying sizes of transparent and open-mesh sacks used for fruits and vegetables. Many solid paper sacks with or without "windows" are used for potatoes, sweetpotatoes, onions, and similar products; lower, various shapes and sizes of folding boxes and trays. The latter are usually overwrapped with transparent film when packed for sale.

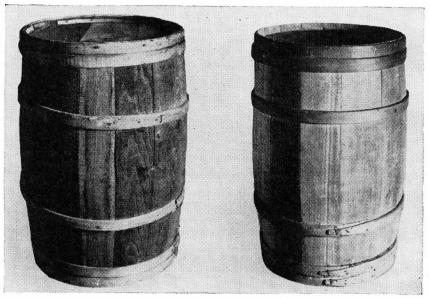
CONTAINERS STANDARDIZED BY FEDERAL LAW

A question that arises often in one form or another concerning containers for fresh fruits and vegetables is: What container is standard for a particular product or in a particular section? Of the four great classes of containers, Federal standards have been established for only two—baskets and barrels. The only other standards are those which have been established by State law or regulation, and those which have become virtual standards through common usage.

Some 29 States and the District of Columbia have, at one time or another, established standard containers for specific products, and at one time 121 such standards, chiefly for crates and boxes, were in effect.² However, examination usually discloses that packing practices may have changed without corresponding adjustments having been made in the standards, with the result that in not a few instances the published standards fail to reflect current container usage.

STANDARD BARREL ACT, 1915

The first Federal standard container to be established was the standard apple barrel in 1912. In addition to fixing the size and dimensions of the barrel, the Standard Apple Barrel Act set up certain standard grades for apples. These grades have been superseded by further developed grades, so that with the passage of the Standard Barrel Act in 1915, the Standard Apple Barrel Act, while still on the statute books, has become obsolete.



PMA 17920

Figure 2.—U. S. standard barrels: Left, fruit and vegetable barrel; right, cranberry barrel.

The Standard Barrel Act established two standard barrels: (1) The standard fruit and vegetable barrel having the same dimensions and capacity as the standard apple barrel, and (2) the standard cranberry barrel of entirely different capacity and dimensions. It also provided for three standard subdivisions of both barrels, the three-quarter, one-half, and one-third barrels. Neither of these barrels and no subdivision bears any basic relationship to the standard bushel or to each other.

The cranberry barrel was designed to hold 100 pounds of cranberries and has a capacity of 5,826 cubic inches, or slightly less than 87 quarts. The fruit and vegetable barrel (fig. 2), both in capacity and

² U. S. Dept. Agr., Food Distribution Admin., Summary of Federal and State Laws Concerning the Marketing of Fresh Fruits and Vegetables. (Processed.)

dimensions, is substantially the same as the commonly used flour barrel of that day. It has a capacity of 7,056 cubic inches, and although generally considered to be the equivalent of 3 bushels, it actually contains 604.7 cubic inches, or 9 quarts, more than 3 bushels, and is sometimes referred to as a 13-peck barrel. Except in the case of the one-third cranberry barrel, which is no longer used, no appreciable use was ever made of the small-sized barrels. The cranberry barrel itself is obsolete, and, except for export, the fruit and vegetable barrel is of minor importance as a container for fresh fruits and vegetables.

The act does not apply to barrels used for products packed and sold by weight or numerical count, an example of which is the 4-bushel

barrel sometimes used for bunched vegetables in the South.



PMA 17921

Figure 3.—U. S. standard 1-pound mushroom basket, and 2-, 4-, and 12-quart Climax baskets.



PMA 12875

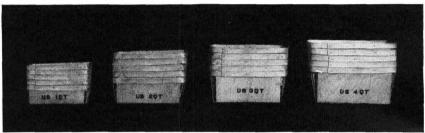
Figure 4.—U. S. standard ½-pint, 1-pint, and 1-quart berry baskets (American type).

STANDARD CONTAINER ACT OF 1916

Two Federal laws govern the manufacture, sale, and shipment of baskets and hampers for fresh fruits and vegetables. The Standard Container Act of 1916, enacted under the commerce clause of the Constitution, established three standard sizes—2, 4, and 12 quarts—and prescribed the dimensions of Climax baskets for grapes and other fruits and vegetables. As amended in 1934, the act also provides for and prescribes the dimensions of a 1-pound Climax basket for mushrooms and restricts its use to that product (fig. 3).

This act also fixes the standard sizes of "baskets and other containers for small fruits, berries, and vegetables," requiring them to be of ½-pint, 1-pint, or 1-quart capacity, dry measure, or a multiple of the dry 1 quart. Until superseded by later legislation, this section of the act was applied to baskets of all types, including hampers, but at present its application is restricted to such containers as small till baskets that are of the same general form and construction as berry baskets and till baskets (figs. 4, 5, and 6). As no dimensions are

prescribed, berry baskets and till baskets of various shapes and construction have been more or less commonly used in different parts of the country (fig. 6). Till baskets are either square or oblong and, when made of wood, are bound at the top with either wooden or metal bands. The manufacture and use of the square type, many of them made of paper, is confined mainly to the Pacific Coast States.

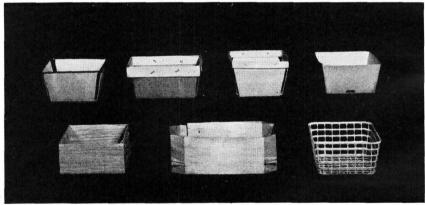


PMA 17922

FIGURE 5.—U. S. standard 1-, 2-, 3-, and 4-quart oblong wood-rim till baskets.

STANDARD CONTAINER ACT OF 1928

The Standard Container Act of 1928 fixed the standard sizes of hampers, round stave baskets, and splint or market baskets. This law differs from the Standard Container Act of 1916 in several notable respects. Like the Standard Barrel Act, it was enacted under the weights and measures clause of the Constitution and hence applies



PMA 18239

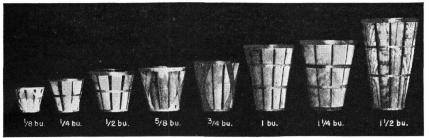
FIGURE 6.—Types of berry cups: Upper, metal rim, oblong, American, and paper; lower, Hallock, Leslie, and plastic. The latter was first used in 1949 for California strawberries.

in intrastate as well as interstate transactions. It prohibits the manufacture, sale, or shipment of hampers, round stave baskets, and splint baskets, filled or unfilled, the dimension specifications for which have not been submitted to and approved by the Secretary of Agriculture, and it restricts such approval to containers that are of proper standard size and not deceptive in appearance. Under these provisions a

marked degree of uniformity in the size, form, and shape of these

containers has been brought about.

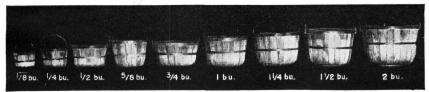
Nine standard sizes of hampers and round stave baskets are provided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1, $\frac{11}{4}$, $\frac{11}{2}$, and 2 bushels. Not all of these are commercially important. The 2-bushel hamper has never been used for fruits and vegetables, and except for farm or orchard use, this is true also of the $\frac{11}{4}$ -, $\frac{11}{2}$ -, and 2-bushel round stave baskets. The three smallest sizes of hampers have been used chiefly in New England and



PMA 17923

FIGURE 7.—U. S. standard hampers; 2-bushel size not shown.

the Middle Atlantic States, mostly in retail stores, farmers' markets, and roadside stands. The ½-bushel hamper is preeminently a cannery package, particularly for tomatoes, but serves as a general marketing container in Philadelphia and surrounding territory. The use of the 1½-bushel hamper has been confined to the shipment of vegetables from North Carolina, and the use of the ¾-bushel hamper to similar products originating in the Southeast and Gulf States. The most important hamper for shipping purposes is the 1-bushel size (fig. 7), although the 1½-bushel size was at one time extensively used



PMA 17936

FIGURE 8.—Nine U. S. standard sizes of round stave baskets, round-bottom type.

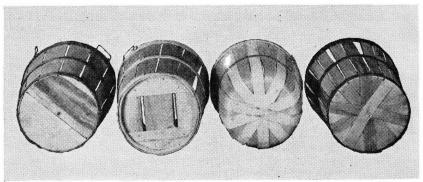
for cabbage and lettuce shipped from points along the Atlantic seaboard.

Of the nine standard sizes of round stave baskets only two are commercially important—the ½- and 1-bushel sizes (fig. 8). A very few ½- and ½-bushel sizes are used in roadside marketing. The origin of the term "round stave" is obscure, but it seems fairly certain that it was first used to differentiate this type from the rectilinear woven type or market basket. There are two principal types—those in which the sides and bottom are formed from continuous staves, and those made of short staves and a separate solid or built-up bottom piece.

When made with only two outside hoops, one at the top and one midway between the top and bottom, continuous-stave baskets are

usually called round bottom baskets, reflecting the curved nature of the bottom. When a third hoop is placed at or near the bottom, the angle between the sides and bottom is more pronounced, and the sides and bottom are, respectively, relatively straight and flat. Such baskets have been variously called "bent bottom," "straight side," "flat bottom," "tub," and other more or less descriptive terms. To simplify matters for administrative purposes, continuous-stave baskets are classified either as two-hoop or three-hoop baskets. In the trade, the latter, and all noncontinuous-stave baskets, which are always constructed with three, rarely four, outside hoops, are called tub baskets or simply tubs (fig. 9).

Of all the baskets used for fresh fruits and vegetables, the splint or market basket is the one that most nearly conforms to the dictionary definition of baskets, namely, "A vessel of varying capacity made of flexible material, such as twigs, splints, or strips of metal, interwoven and commonly bound at the top." Formerly manufactured in tremen-



PMA 17865

FIGURE 9.—Round stave basket construction: Solid bottom, built-up bottom, round bottom, and bent bottom.

dous quantities and used over wide areas for fish and meat products as well as for the local marketing of fresh fruits and vegetables, the old, original diamond-weave basket with characteristic drop or rigid overhandle, has been all but displaced by improved types of containers except in a comparatively few and rather isolated areas. In the North Central States, for tomatoes, lettuce, celery, bunched vegetables, and similar products, it has been almost entirely supplanted by the improved square-braid type of much greater strength and rigidity which has proved satisfactory not only for local use, but also for shipment by motortruck and rail to distant points.

Six standard sizes of splint baskets are provided: 4-, 8-, 12-, 16-, 24-, and 32-quart (fig. 10). Paperboard baskets of the same standard sizes and the same general dimensions have become popular in certain

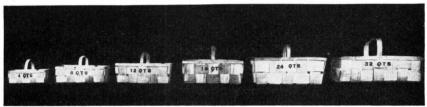
sections for certain products.

BASIS FOR STANDARDIZATION

The standard sizes of baskets and hampers prescribed by the U. S. Standard Container Acts of 1916 and 1928 are based on the so-called Winchester bushel of 2,150.42 cubic inches, first recognized in the

United States in 1836 through a resolution of Congress authorizing the Secretary of the Treasury to prepare a set of standards for use in customhouses and for other purposes. The Treasury Department adopted the Winchester bushel, which dates back to 1495 when Henry VII of England promulgated the Winchester corn bushel of 2,150.5 cubic inches and the Winchester corn gallon. However, the United States standard dry quart of 67.2 cubic inches and the United States standard bushel of 2,150.42 cubic inches were first defined by Congress with the enactment of the Standard Container Acts of 1916 and 1928.

A container subject to either act is deemed to be of proper standard size if it contains the prescribed number of cubic inches, struck measure, within tolerances which have been established to take care of variations occurring in the course of manufacture. A package based on a unit of fixed and uniform value, such as the United States standard dry quart or bushel, when filled level full, is easily recognized as full measure, and any variation or slackness in filling is at once detectable even by the untrained eye.



PMA 12876

Figure 10.—Six standard sizes of splint or market baskets (square-braid type).

Besides being of standard capacity, containers for products sold by measure, whether baskets or crates, should be of such form and dimensions as to be readily identified and differentiated from any other. Otherwise, on a competitive market, proper evaluation of quantity cannot always be readily made. Containers based on arbitrary standards afford an opportunity for the unscrupulous dealer to take unfair advantage of both the buyer and seller (fig. 11).

ENFORCEMENT OF THE ACTS

Rules and regulations for carrying out the provisions of the Standard Barrel Act were prepared by the Director of the National Bureau of Standards, United States Department of Commerce, and the act is administered by that Bureau. They are published in Circular No. 71 of the National Bureau of Standards, entitled "Rules and Regulations Promulgated under Authority of the Federal Standard-Barrel Law."

The two Standard Container Acts are administered by the Fruit and Vegetable Branch, Production and Marketing Administration, under rules and regulations promulgated by the Secretary of Agriculture.

These three laws have done away with a large number of unnecessary and deceptive sizes of barrels, hampers, and baskets, and the established standard sizes of each type are now largely made on standard or recommended specifications. At frequent intervals baskets and hampers are tested at each factory, and by this means and with the coop-

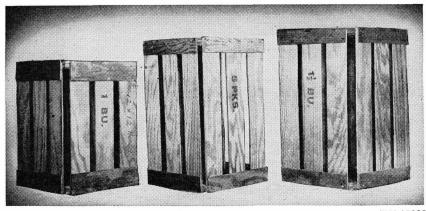
eration of the manufacturers, the public is assured of uniformly standard barrels, hampers, and baskets which it has come to accept largely as a matter of course.

IMPORTANCE OF STANDARDIZATION

The average citizen has a greater interest in standard containers for marketing fresh fruits and vegetables than he may generally realize. He is at all times a consumer, and he may be a grower or shipper, a receiver, or retailer of these commodities. Or he may be a container

manufacturer or an official of a transportation agency.

Standardization or simplification has been defined as reduction in industrial waste through the elimination of unnecessary sizes, types, and dimensions of manufactured products. Consequently, as a consumer, the average citizen pays a large part of the ultimate aggregate increased costs of marketing fresh fruits and vegetables that are attributable to avoidable waste—waste due to the greater expense of manufacturing a large number of different sizes and types of containers; waste inherent in the handling of odd-sized containers in transportation and in storage; and waste due to damage in transit and in the distributive process because of weak containers. Besides, he may be directly or indirectly defrauded by the substitution of a short-measure container at the full-measure price.



PMA 17925

FIGURE 11.—Packages based on standard units of measure are usually readily identified and differentiated. Any variation or slackness of filling is readily detected.

The grower or shipper benefits from any action that lowers the cost of packages, that tends to reduce damage in transit and the cost of merchandising, and that provides him with a definite basis of sale and market information so far as the size of package is concerned. Standard containers relieve him from the unfair competition of a competitor who might otherwise use a short package.

To the manufacturer standardization of containers means that production is simplified and that he can concentrate on and carry in stock a relatively few sizes, with consequent lowering of manufactur-

ing, handling, storage, and inventory costs.

To the carrier it means the elimination of many sizes and types that now contribute to the problem of damage in transit, and narrows the problem to a few sizes for which strength specifications can be worked out, approved methods of loading devised, and fair billing weights established.

The use of innumerable sizes and types of containers is recognized by many in the fruit and vegetable industry as constituting an unnecessary burden upon the industry, and has resulted in loss of product and other waste, higher container costs, price manipulation by buyers, and other practices detrimental to the growers and shippers, and ultimately to the general public.

BUSHEL WEIGHTS—HEAPED BUSHEL

Another frequently arising question relates to the weight of fresh fruits and vegetables. What is the standard weight of a particular product, or what should be the net weight of a given product when packed in a particular container? Many States have attempted to define a bushel of various fresh fruits and vegetables in terms of weight but the Federal Government appears to have done so in only one instance, namely, in 1922 when for use in customhouses a bushel of green or ripe apples was defined as 50 pounds. The United States Department of Agriculture has taken the position that the establishment of standard bushel weights for such products is impracticable because the weight of any given volume of fresh fruits and vegetables is likely to vary with the variety, size, maturity, and condition of the product, and the tightness of pack.

Wide differences are to be found in the weights per bushel prescribed by State laws for fresh fruits and vegetables. To illustrate, the legal weight per bushel of sweetpotatoes is 46 pounds in North Dakota and 60 pounds in Maryland. Between these two extremes, 14 States prescribe 50 pounds, 10 States 54 pounds, 5 States 55 pounds, and 5 other States 56 pounds. In like manner, the legal weight per bushel of unshelled green peas is 26 pounds in Connecticut and 56 pounds in Missouri, Oklahoma, and South Dakota. Maryland and Virginia prescribe 60 pounds for a bushel of tomatoes, but in Missouri and Oklahoma 45 pounds constitute a legal bushel. Similar variations obtain

with respect to other products.

The wide variations in the weights adopted by the several States indicate a lack of any definite or consistent method of arriving at such weights. In some instances they appear to represent the weight of a bushel "struck measure"; in others the weights may be based on "heaped" measure, whatever that term may mean or imply in the several jurisdictions. Heaped measure has never been defined by Congress, and in those States where it has been defined, the wording varies and is indefinite. The heap has been referred to as a cone the base of which is the top of the container, the cone to be "as high as may be without special effort or design," or "as high as the article will admit." Under such definitions there might be considerable difference between the volume of a heaped bushel of Damson plums and a heaped bushel of sweetpotatoes.

One New England State limits the sale by heaped measure to "large" commodities, not otherwise defined. A neighboring State defines the heaped bushel as 2,564 cubic inches without indicating a

method for determining the volume of the irregular mass of the product which constitutes the heap. A third New England State, Massachusetts, in 1921 made a comprehensive investigation of bushel weights and, in its report, the investigating committee recommended their abolition, stating that its studies "demonstrated beyond doubt that the entire fabric of bushel weights (in Massachusetts and elsewhere) had been reared upon a most unstable foundation with resultant confusion at various points along the line of distribution from producer to consumer." Legal weights per bushel for fresh fruits and vegetables were subsequently abolished in that State, and similar action has been taken in several other States.

METHODS OF SALE

Of the three methods by which fresh fruits and vegetables are commonly sold—by weight, measure, or numerical count—it is generally recognized that weight is the most definite basis of sale, although for products carefully graded to standard sizes, sale by count may be

equally satisfactory.

It should be borne in mind, however, that most fresh fruits and vegetables are marketed in package form and that the trend continues to be in the direction of smaller packages better suited to modern merchandising methods. Obviously, only a small part of these products can be graded to standard sizes and sold by count, and unless accompanied by a statement of size the mere declaration of the number of fruits in a package may not be adequately informative. For obvious reasons also, transactions involving the sale of packed containers often cannot be made on a net weight basis without adding greatly to the cost of marketing. As has been stated, the weight of a given volume of fresh fruits and vegetables is likely to vary with the variety, size, maturity, and condition of the product, and the tightness of pack.

Also, many sales are made while the products are in transit to market, and even if the weight at time of packing were known, a considerable variation from this weight might occur as a result of shrinkage or decay. Then, too, a shipping container must be filled compactly without regard to weight or the product may be damaged by movement within the container. Under such conditions any designated weight must of necessity be more or less arbitrary, and the time and labor required to weigh each package might more than offset the good

to accrue from a knowledge of the exact weight.

Unless the weight shown on a package accurately represents the actual weight, and unless count designation is accompanied by a declaration of size, such markings may serve no purpose other than to indicate the approximate quantity; and when containers of closely related varying sizes are used and sold at varying prices, accurate marking of contents may be merely bewildering because the ordinary person cannot readily evaluate quantities that vary by small amounts.

Moreover, the character of the contents of a package is usually of as much consequence to the purchaser as is the quantity, and most fresh fruits and vegetables shipped in interstate commerce are now bought and sold on the basis of official Federal or State grades. The successful marketing of products on the basis of count is usually predicated on the use of standard packs—charted arrangements of

the individual fruits or vegetables comprising the pack—which indicate the number or quantity and size of the product so packed. Manifestly, such a standard pack must be based on the use of a standard and uniform container.

Thus, the conclusion seems inescapable that in the case of most packaged goods, the expeditious handling of fresh fruits and vegetables and maximum protection for the buyers and sellers lie in the use of standard packages whereby the quantity of the contents, whether expressed in terms of weight, measure, or count, can be most

readily and fairly evaluated, largely on the basis of fill.

Massachusetts was the first of several States which now recognize the necessity for and validity of standard containers as appropriate merchandising units for fresh fruits and vegetables. As enacted in 1922, Massachusetts law provides, in substance, that, except when sold in the original unbroken standard container, all fresh fruits and vegetables shall be sold at retail by avoirdupois weight or numerical count. The term "original unbroken standard container" is defined as including barrels, boxes, baskets, or similar containers, the capacity of which has been established by Massachusetts or Federal law, properly marked as to net contents in terms of weight, measure, or numerical count, and from which the contents have not been removed or repacked.

The conditions under which a standard container shall be recognized as a legal merchandising unit are fairly stated in the foregoing definition. Although, to minimize the loss, it may sometimes be necessary to recondition abnormally deteriorated produce to make it more readily salable, weights and measures officials observe that such repacked containers do not always contain the equivalent of the original contents; also, that the practice of repacking such products as berries for the express purpose of gaining an extra quart or two from a crate is not uncommon. Moreover, misuse of a standard container may nullify its integrity as a sound merchandising unit, such as when berry cups are used for selling apples and similar large products for which the container is not adapted and was not intended to be used (fig. 12). In any case, it should not be contemplated that a standard

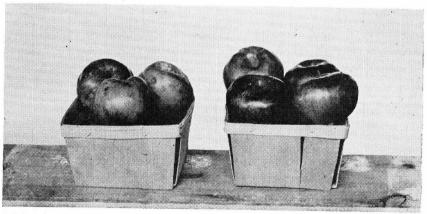


Figure 12.—Misuse of a standard container. Berry baskets are well suited as a measure for berries and similar small commodities, but not for larger products, such as apples.

container, as defined, may lawfully be used as a measure for dry prod-

ucts in any jurisdiction which prohibits sale by measure.

Thus, whether the sale of fresh fruits and vegetables shall be by weight, measure, or count, depends upon the circumstances. In general, it may be said that the sale of packed fruits and vegetables in the original unbroken standard container may be by the package, but when such containers are broken in order to dispose of the contents in smaller quantities, sales should be by net weight or numerical count.

MISBRANDING

In connection with the marketing and distribution of fresh fruits and vegetables the question frequently arises as to what markings are required. This varies with the several States, some of which have no marking requirements while in others the requirements may be quite general or quite explicit and elaborate. A greater degree of uniformity would be desirable.

There are two Federal laws applying to the marking of containers for fresh fruits and vegetables. The United States Food, Drug, and Cosmetics Act provides, in part, that food in package form shall be deemed to be misbranded if its labeling is false or misleading in any particular; if the container is so made, formed, or filled as to be misleading; and if the package is not marked to show the name and place of business of the manufacturer, packer, or distributor, and an accurate statement of the net contents in terms of weight, measure, or numerical count.

The Perishable Agricultural Commodities Act, enacted in 1930, provides, in part, that it shall be unlawful in or in connection with any transaction in interstate or foreign commerce for any commission merchant, dealer, or broker, for a fraudulent purpose, to misrepresent by word, act, mark, stencil, label, statement, or deed, the character, kind, grade, quality, quantity, size, pack, weight, condition, degree of maturity, or State or country of origin of any perishable agricultural commodity received, shipped, sold, or offered to be sold in interstate or foreign commerce.

With respect to any statement or declaration of quantity or weight, this provision is construed to mean that at the time determination is made packages of fresh fruits and vegetables shall contain the quantity or weight marked thereon within reasonable tolerances for normal

shrinkage.

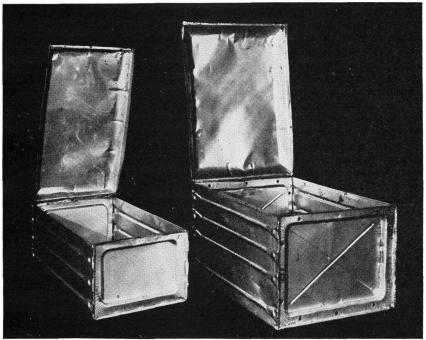
PROPER FILLING

It is greatly to the advantage of all parties engaged in marketing fresh fruits and vegetables that proper methods of filling containers be employed. If containers are not well filled the waste space increases package costs and also the cost of transportation, since freight charges are frequently based on estimated weights per package. Moreover, the product is likely to be shaken and bruised in transit and then discounted in the markets because of slack pack and generally poor appearance.

To insure full pack at destination and prevent damage due to movement within the package, it is customary to pack fresh fruits and vegetables with a bulge or crown above the top of the container, so that some pressure is necessary to properly secure the cover. When the amount of bulge is not excessive, this is desirable and justifiable practice, but in recent years bulge packing has been carried to extreme

and indefensible lengths (fig. 13).

Of the loss and damage claims paid by the carriers each year on fresh fruit and vegetable shipments, no small part is attributed by the railroads to package failures primarily due to excessive bulge and pressure packing which often prevents the covers from being securely fastened and otherwise weakens the containers through undue stresses and strains. To minimize this evil and at the same time prevent abuse



PMA 18240

Figure 13.—New departure in packages. Light-weight metal containers having the same inside dimensions as the wooden L. A. and half L. A. crates, used in experimental shipments of lettuce and bunched carrots from California in 1949. Proponents claim that these crates do not require package ice and will accommodate the usual packs without excessive bulge, thus reducing breakage in transit.

of the estimated weight privilege, the carriers, through appropriate tariff provisions, have placed limitations on the amount of bulge permitted on certain containers packed with certain products when

shipped by rail.

Examination of produce delivered at retail stores, often in apparently undamaged containers, shows that excessive pressure packing has become one of the most serious and costly evils in the marketing of fresh fruits and vegetables. The bruising of apples and peaches, the breaking of celery stalks, and similar damage, oftentimes extending into the center of the package, bear testimony to the harmful effects

of pressure packing. The resulting losses, either by reason of unsalability of the produce or of resales at heavy discounts in price, run into

large figures.

Neither the consumer nor the grower would seem to have anything to gain from such wasteful practices and the reason for continuing them is generally attributed to the demands of the distributive trade for heavy packs with which "to meet competition." Finding a way to dissolve a vicious circle of this kind presents a challenge to the entire fresh fruit and vegetable industry.

NONSTANDARDIZED CONTAINERS

Although laws have done away with a large number of unnecessary sizes of baskets and hampers, and a similar degree of simplification was probably accomplished in the case of barrels, there remain two great classes of containers for which no Federal standards have been established and to which it is believed the principle of standardization could be applied with equally beneficial results. These two classes crates and boxes and sacks—are used in far greater volume for fruits and vegetables than are baskets, hampers, and barrels. Exact figures are unavailable, but it has been estimated that approximately 5 percent of the total annual movement of fresh fruits and vegetables is shipped in bulk, 10 percent in baskets, hampers, and barrels, 35 percent in sacks, and the remaining 50 percent in crates and boxes. The latter are made in a wide diversity of sizes and shapes, and types of construction which is believed to complicate and interfere with the efficient marketing and distribution of the products packed in them.

The diversity arises from various causes. In some instances it reflects merely the perpetuation of packages originally designed for local use for which they may have been well suited. Sometimes the diversity reflects the desire of an individual or community to use a distinctive package. Almost always, to some degree, it reflects the species of woods and the lumbering practices of the section in which the containers are produced. Frequently the multiplicity is due to attempts by growers and shippers to build a closely fitting package around a given quantity of produce, such as 2 dozen heads of lettuce or 1 or 2 dozen melons, products which by nature vary appreciably in size in the same field. Crates and boxes have been used in sizes based on the United States standard fruit and vegetable barrel and the United States standard cranberry barrel and subdivisions, the weight

bushel, the heaped bushel, and the struck-measure bushel.

Occasionally a container appears to be nothing more or less than an attempt by a shrewd packer to substitute a short-measure package for a generally recognized standard. Besides these factors, the persistent and laudable efforts to develop an improved type or size of package often merely contribute to the multiplicity. Nevertheless, since improvements can be brought about only through trial and experimentation, such efforts are and should be encouraged.

RAILROAD CONTAINER TARIFFS

In connection with the efforts to reduce loss and damage in transit and claims arising therefrom, the railroads, under authority of the Interstate Commerce Act, publish the precise dimensions and strength specifications of all containers acceptable to the railroads for transporting fresh fruits and vegetables. These specifications are contained in four so-called container tariffs, each of which applies in well-defined sections of the United States. In general terms, one tariff applies in the far West; another in the Prairie States west of the Mississippi River; a third in the Southeastern States; and the fourth in the Northeastern States. A relatively small number of identical containers are authorized for rail shipment in all sections. For the most part each tariff reflects the containers peculiar to the section in which it applies.

WARTIME CONTAINER SIMPLIFICATION

A year or two before World War II the container tariffs provided for more than 400 different sizes of crates and boxes, wooden and fiber, but because of varying types of construction the number of detailed manufacturing specifications totaled more than 500. This number did not include containers for products transported other than by rail, such as by motortruck, the number of sizes of which is not known although some 75 or 80 sizes have been tabulated.

The unprecedented demands of World War II for containers of all kinds for munitions and other war matériel and for civilian use resulted in serious shortages of the materials used in the manufacture of containers, and necessitated measures designed to conserve such materials. Steps were taken to simplify and standardize fruit and vegetable containers and to conserve them through salvage and reuse.

The fresh fruit and vegetable industry had previously taken the initiative in this effort, and in cooperation with the railroads, the number of sizes authorized for rail shipment was reduced from over 400 to less than 200. Subsequently, to insure an adequate supply of containers, recommendations were made which resulted in the promulgation of War Production Board Limitation Order No. L-232, issued March 1, 1943. This order restricted the manufacture of wooden containers for fresh fruits and vegetables to 64 specified sizes (later increased to 74 sizes), considered adequate and necessary for the distribution of fruits and vegetables. Except in isolated instances, the relatively few sizes authorized by the order were apparently quite adequate to meet essential needs. The order terminated with the cessation of hostilities August 5, 1945. Three years later, in 1948, the container tariffs still provided for approximately 200 sizes of wooden and fiber crates and boxes, and the diversity of sizes not published in the tariffs was about the same as existed prior to the war.

UNOFFICIAL STANDARD CONTAINERS

Many of the crates, boxes, and sacks for fresh fruits and vegetables have become virtually standard through common usage. Largely through the foresight of manufacturers and the cooperation of shippers and receivers, the sizes of sacks have been effectively reduced in number. For some products, such as green corn, odd sizes of sacks may still be used in certain localities; but the 50-, 25-, 10-, and 5-pound sacks for dry onions, the 100-, 50-, 25-, 15-, and 10-pound sacks for potatoes, and the 50-pound sack for cabbage have become well established as standard merchandising units in the principal

producing areas. Unfortunately, the sacks used in the several citrus fruit producing areas differ in size, as do the boxes used in those areas.

Not a few crates and boxes, the dimensions of which have remained uniform and unchanged for many years, have become well established merchandising units throughout the country. Among these are the northwestern apple and pear boxes, the California-Arizona lemon and orange boxes, the Florida and Texas citrus fruit boxes, the California artichoke and avocado boxes, the western-type cauliflower, cantaloup, and honeydew crates, the pepper crate, the pineapple crates, and several berry crates.

Western lug boxes, fruit boxes, and four-basket crates have attained a similar status as standard merchandising units. These containers, respectively, are constructed on uniform specifications as to width and length, but are likely to vary in depth, depending upon the nature or size of the products packed in them. In each instance four basic standard depths are more or less commonly used, although these depths are sometimes increased by the use of cleats under the cover when the nature of the product requires.

The so-called Los Angeles or L. A. crate, widely used as a merchandising unit for lettuce, bunched vegetables, cabbage, and other products is not always of uniform inside dimensions, although the variation in capacity is relatively small, about 5 percent. As standardized by California law, three sizes are provided, namely, 13 by 18 by 215% inches, 13 by 17½ by 215% inches, and 13¾ by 17½ by 215% inches, inside measurements.

The list of products for which the above containers are reportedly used is impressive and includes apples, berries, grapes, peaches, pears, plums, persimmons, pineapples, pomegranates, nectarines, oranges, grapefruit, tangerines, lemons, artichokes, avocados, bunched beets, carrots, turnips, broccoli, brussels sprouts, cabbage, cauliflower, cantaloups, honeyball and honeydew melons, eggplant, endive, escarole, lettuce, romaine, peppers, rhubarb, and tomatoes. The relatively few products for which the containers are not customarily used include apricots, prunes, limes, kumquats, cherries, figs, asparagus, celery, green corn, radishes, and sweetpotatoes.

Considering the wide range and volume of the products commonly shipped in the crates and boxes mentioned above, a reasonable estimate, based on carlot shipments, would seem to indicate that relatively few sizes of containers are used for fully 75 percent of the fresh fruits and vegetables normally shipped in crates and boxes, and that the confusing multiplicity of containers obtains chiefly with respect to the remaining 25 percent of the products for which crates and boxes are used.

However, it should not be inferred that the containers enumerated above are necessarily considered adequate or suitable for all products under all conditions, or that in all instances they are considered essential. Some of them may be superfluous. On the other hand, certain products may require special sizes and types of containers. Changing merchandising methods or other factors may necessitate new and improved types and sizes for any number of products. The enumeration of certain generally acceptable containers and the products shipped

in them is intended to show the apparent flexibility and adaptability of fresh products as packed for market, and to suggest that many of the sizes of containers currently in use may be wholly unnecessary to the efficient marketing of fresh fruits and vegetables.

CONTAINERS COMMONLY USED

The containers used for shipping a given commodity may vary in different producing areas, and even within a given area. Baskets, crates, sacks, or barrels may be used and the containers may vary in size and type of construction. The increase in the production and interstate movement of fresh fruits and vegetables, the development of new producing areas, the penetration into one section of containers popular in other sections, and the pressing problem of increasing costs of marketing, have stimulated interest on the part of growers and shippers in the containers used throughout the country for the products grown for shipment.

It is impossible to mention all of the different containers that may be used in different sections at different times. In many instances no particular container predominates, and whatever is handy is used. This is particularly true of produce taken into city markets by nearby farmers who use a variety of packages, many of them second-hand apple and pear boxes, L. A. crates, lug boxes, citrus fruit boxes, and round stave baskets. In this bulletin an effort will be made to mention the containers which appear to be most favored in the more important

shipping sections.

APPLES 3

The principal types of containers for the shipment of apples are the box and the basket. For certain tender varieties like the McIntosh, as grown in New England and the Hudson River Valley, cell-type fiberboard boxes have been used for several years. More recently, molded trays, which also provide a separate compartment for each apple, have gained some popularity (fig. 14). The trays are varied in design to accommodate several standard sizes of apples, but are of uniform width and length which permit all sizes of apples to be packed in a master container of uniform dimensions, usually 11½ by 12 by 20 inches, inside. Cell-type packing requires cells and shipping cases of different size and shape for each size of apple.

The prepacking of apples in consumer units has received attention in all producing sections and with some degree of local success. Trays, overwrapped with film, and variously devised folding boxes have been used, but the 5-pound mesh bag appears to have gained widest general acceptance. However, a number of shipments in 3-, 4-, and 5-pound transparent film bags were successfully made from the West during the 1948-49 season. In the East, the 5-pound mesh bags are often shipped in reused wirebound citrus boxes (12 by 12 by 24 inches), 8 or 10 bags to a box. The western shipments were made in fiberboard boxes, approximately 12½ by 12½ by 20 inches, inside, fourteen 3-pound, eleven 4-pound, and nine 5-pound bags to a box. One common criticism of bags as well as other types of consumer packs of apples is failure to disclose clearly the true variety of the fruit.

³ U. S. Dept. Agr. Farmers' Buls. 1457, Packing Apples in Boxes, and 1695, Preparing Apples for Market in Barrels and Baskets, give additional facts concerning apple containers.

The barrel, formerly extensively used in the eastern part of the country, has, for the domestic market, been all but supplanted by the box and basket.

The northwestern apple box (fig. 15) has been standardized by law in a number of States, including Maine, Vermont, Massachusetts, Virginia, and the District of Columbia in the East. Although in Cali-



PMA 17868

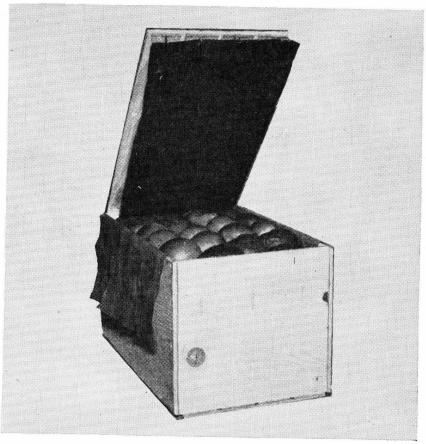
FIGURE 14.—Molded tray fruit box. The trays are varied to accommodate several sizes of fruit, but are of uniform width and length so that all sizes may be packed in a box of uniform dimensions.

fornia for certain varieties other boxes are occasionally used for apples, the northwestern box is the container that comes to mind when western apples are mentioned, and it is being used increasingly in eastern producing sections.

Wherever it is used, the inside dimensions of this box are uniformly 10½ by 11½ by 18 inches, giving it a capacity of 2,174 cubic inches, or virtually a standard bushel. As a rule, the apples are carefully

graded to size, wrapped, and place-packed, and the contents designated in terms of count, although some eastern shippers employ the face-andfill method of packing. Unfortunately, this generally suitable package is among those which are all too frequently subjected to excessive pressure packing which results in damage such as has been previously described.

To facilitate the distribution of apples throughout the Plains States, western shippers employ a half apple box which is a miniature counter-



PMA 17918

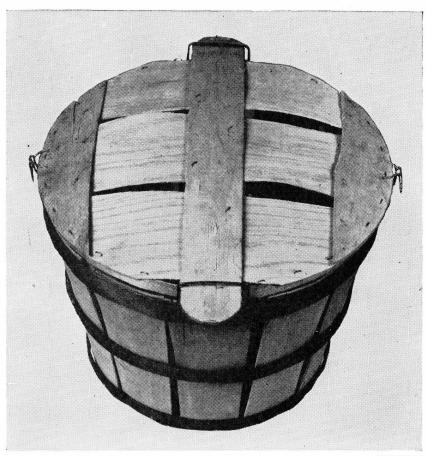
Figure 15.—Northwestern apple box. In this container the apples are usually wrapped and place-packed. Note the absence of excessive bulge.

part of the standard box, having inside dimensions of 75% by 85% by

161/8 inches, and a capacity of 1,060 cubic inches.

The 1-bushel tub basket (fig. 16) is perhaps the most widely used container for eastern apples. The growth in the popularity of this container dates from the early 1920's following the development of various types of straight-side baskets and the introduction of ringpacking devices. There are two principal types: The so-called continuous-stave, bent-bottom type in which the sides and bottom are

formed from continuous staves, and the stitched-in-bottom type constructed of short staves and separate solid or built-up bottom pieces. The latter are believed to be superior, particularly for storage purposes. Baskets are usually packed face and fill, with a decided bulge or crown, and closed with a raised cover secured by means of a cross-slat extending across the top and under the two opposite wire handles, sometimes supplemented with two or more wire loop fasteners spaced



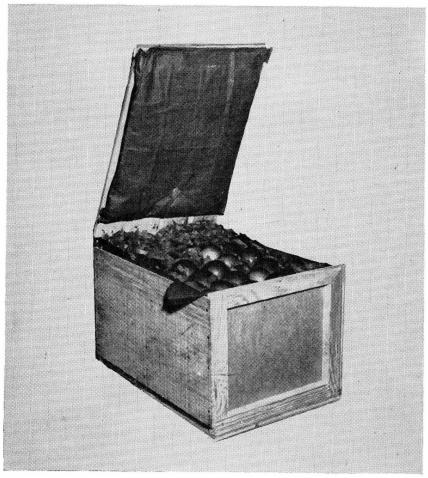
PMA 17863

FIGURE 16.—Round stave tub basket showing desirable 4-point fastening of cover, with ends of the cover slat under the handles, and wire loops midway between the handles.

between the handles. Unless the cover is securely fastened at four points damage from rim cutting is likely to occur. The packing of baskets with some bulge is probably unavoidable, the bulge being due in part to the raised cover commonly used, but there seems to be no doubt that the bulge is often excessive and that this contributes to the damage found in these containers.

The use of boxes for eastern apples is increasing, and although numerous varying sizes are to be found, two sizes appear to predominate.

One of these is the northwestern apple box previously described, many of which are placed-packed as in the West. The other is the so-called eastern apple box, the inside dimensions of which are 11 by 13 by 17 inches, giving it a capacity of approximately 2,431 cubic inches, or 1½ bushels (fig. 17). Practically all of these boxes are packed face and fill, the quantity of apples being substantially the same as con-



PMA 17917

Figure 17.—Typical eastern apple box, usually packed "face and fill." Illustration shows use of shredded oiled paper and desirable absence of excessive bulge.

tained in a standard 1-bushel tub basket as commonly packed and closed with a crown cover. When made of wood, eastern apple boxes are made with solid ends, cleated ends, and paneled ends. Some fiber-board boxes of this size also are used.

Various types of "open packages" are used in the East. These packages are never completely filled so that they may be stacked one on another without injuring the fruit beneath, and the closure often

consists of little more than a paper pad held in place by two or three narrow slats. The absence of pressure packing is believed to result in a minimum of bruising and stem punctures. Slatted crates, without covers, are used for practically all Michigan apples marketed in the Detroit area. Open packages, used for western apples, include a so-called one-way lug, 7 by 14 by 22 inches, inside, and an oversize version of the northwestern apple box which measures $11\frac{1}{2}$ by $11\frac{1}{2}$ by 18 inches, inside.

APRICOT

Apricots are shipped in the fresh state chiefly from Washington and California, but carlot shipments also are made from Utah, Colorado, Idaho, and Oregon. Practically all fresh apricots shipped from California are packed in a California standard lug box holding 24 to 25 pounds, net weight. The inside dimensions are 45% by 12½ by 16½ inches. This box and another, measuring 4 by 11 by 15½ inches, inside, are used in Oregon. Two different boxes are used in Washington. One measures 35% by 10½ by 15 inches; the other 4 by 10½ by 14 inches, inside. In Colorado, Utah, and Idaho apricots are shipped chiefly in ½-bushel tub baskets, but some shipments are made in the L. A. lug box (5¾ by 13½ by 16⅓ inches) which holds approximately 24 pounds of fruit.

ARTICHOKES

The production of Globe artichokes centers in Santa Cruz County, Calif., and for many years this produce was shipped in either one of two boxes, both standardized by State law. The full-sized box measures 934 by 11 by 2056 inches, inside, and the half-box, 476 by 11 by 2056 inches, inside. The larger box is sometimes used for certain varieties of apples produced in the same district, and the half-box for rhubarb. To minimize damage resulting from bulge packing, experimental shipments were made in 1948 of artichokes packed without a bulge in a box of the same width and length, but 7 inches deep and holding the same quantity as customarily packed in the half box. This packing may come into general use.

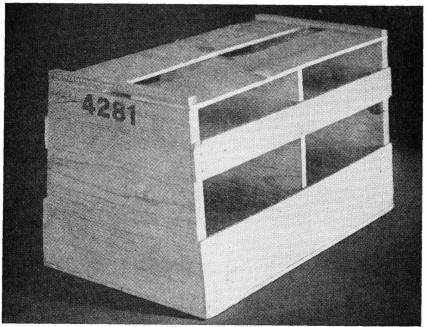
ASPARAGUS 4

Asparagus is usually shipped in a so-called pyramid-type crate that reflects the tapering nature of the product, but varying sizes are used (fig. 18). The California law provides for two crates differing slightly in depth and bottom width, but otherwise identical. However, the crate most commonly used is something of a compromise between the two. It is 10½ inches deep, 9½ inches wide at top, 11 inches wide at bottom, and 18 inches long, inside, and it holds 12 bunches. It is also used in western Washington. In eastern Washington a smaller crate, holding 12 pounds of unbunched asparagus, is used. The dimensions of this crate are: Depth, 8½ inches; width at top, 5¼ inches; bottom width, 9½ inches; length, 12 inches.

⁴The preparation of asparagus for market is discussed in U. S. Dept. Agr. Farmers' Bul. 1646, Asparagus Culture.

The crates used in eastern producing areas vary appreciably in size and shape. Typical dimensions of the container used in New Jersey and surrounding areas are: Depth, 11 inches; top width, 93½ inches; bottom width, 12 inches; length, 16½ inches. For the relatively tall and thin asparagus produced in South Carolina, a crate 12½ inches deep is used. The top width is 9½ inches; bottom width, 10½ inches; and the length, 17¼ inches, inside measurement.

Rectangular compartment crates holding 20 and 24 bunches, respectively, are used at Cobden, Ill., while at Godfrey, Ill., a small



PMA 13942

Figure 18.—Pyramid-type asparagus crate, used in varying sizes in most commercial producing areas, usually packed with 12 bunches.

pyramid crate holding twelve 1-pound bunches is used. The inside dimensions are: Depth, $10\frac{1}{2}$ inches; top width, 4 inches; bottom width, $5\frac{1}{2}$ inches; length, $17\frac{1}{4}$ inches.

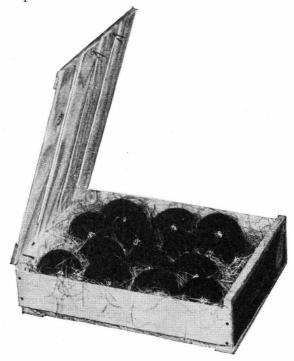
AVOCADOS

For many years avocados were shipped from Florida and California almost entirely by express, often in refrigerated crates, but improved precooling techniques and in-transit refrigeration now permit shipment in full carlots. For interstate shipment California avocados are packed in one or the other of two well established lug boxes. One is 3¾ and the other 4½ inches deep, the width and length being 13½ and 16⅓ inches. The avocados are mechanically sized by weights ranging from 4 to 29 ounces, and the packs range from 8 to 96 fruits per box. For local distribution within the State the L. A.

lug box $(5\frac{3}{4}$ by $13\frac{1}{2}$ by $16\frac{1}{8}$ inches) is used. The flats used in Florida are somewhat smaller. One measures $3\frac{3}{4}$ by $11\frac{1}{2}$ by 14 inches; the other $3\frac{3}{4}$ by 13 by 15 inches, inside (fig. 19).

BEANS

Practically all snap beans, green and wax, and lima beans, are shipped in 1-bushel hampers or 1-bushel tub baskets, although market gardeners in eastern sections use other containers, including the 16-and 24-quart splint baskets.



PMA 18256

Figure 19.—Avocados packed in typical Florida-style container and customary wood wool.

BERRIES 5

Berries of all kinds are packed in ½-pint, 1-pint, and 1-quart cups, the capacities of which are established by the United States Standard Container Act of 1916. There are several distinct and more or less regional types of cups (fig. 6). The American type, with slanting sides and bound at the top with wooden bands, is manufactured and used throughout the East, South, and Middle West. Metal-rim cups differ from the American-type in that they are bound at the top with metal strips. A large part of the annual production is manufactured on completely automatic machines by one factory in the East and one in the West. This type is widely used throughout the country. Paper

 $^{^5}$ U. S. Dept. Agr. Farmers' Bul. 1560, Preparing Strawberries for Market, gives additional facts concerning strawberry containers.

cups, usually made on the general lines of and interchangeable with the American and metal-rim types, are manufactured and used chiefly on the Pacific coast.

Hallocks, formerly made with raised bottoms that permitted packing two or more layers in a crate without dividers and were used extensively in the Northwest and Lake States, have all but been supplanted in those areas by the three types just described. The raised-bottom feature is considered deceptive in many jurisdictions, and by the Federal Food and Drug Administration, and is not permitted in interstate commerce. Without this feature, the Hallock loses the packing advantage referred to. The Leslie type, at one time used in a small section of the Southwest, and the stitched-tray type, peculiar to one or two small areas in the Middle West, have become practically extinct. Oblong, wood-rim cups of 1-pint capacity are used almost exclusively for Florida strawberries and to some extent for raspberries along the Atlantic seaboard.

Special crates have been developed to fit the several types and sizes of cups, and, over the years, many changes have taken place. Those most generally used in the East are the 12-pint, 24-pint, 16-quart, and 24-quart crates (fig. 20). The oblong pint is customarily packed 36



FIGURE 20.—A 24-pint display crate, used in Louisiana.

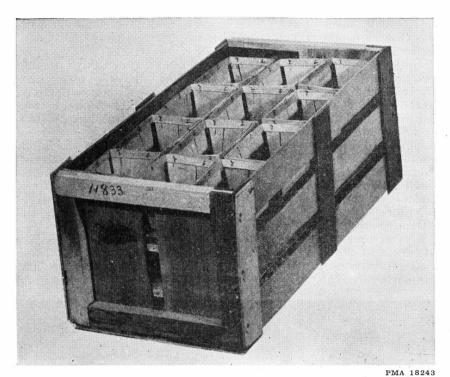


Figure 21.—A 36-pint oblong berry crate, used in Florida.

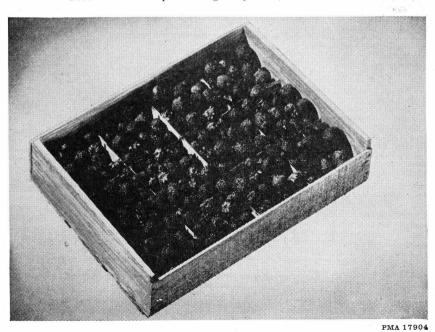


Figure $\,$ 22.—A 12-pint flat berry crate, used in California.

to the crate (fig. 21). Typical dimensions of eastern berry crates are

given in table 1.

On the Pacific coast and in the Rocky Mountain States only the ½-pint and 1-pint cups are used, chiefly the metal-rim and paper types. Typical dimensions of the crates used in this area are given in table 2 (fig. 22).

BROCCOLI

Practically all of the broccoli shipped by rail originates in California, Arizona, Texas, and South Carolina, and three-fourths of it is produced in California. Shippers in Arizona and California use, almost exclusively, the pony cauliflower crate (8½ by 18 by 21½ inches, inside), the usual pack being 28 bunches (fig. 28). Several types of crates are used in Texas, including the pony crate. The crate used in South Carolina is the same one reportedly used for radishes, measuring 7½ by 15 by 18¾ inches, inside. In New York and New Jersey 8 bunches are commonly packed in reused wirebound half citrus fruit boxes (9½ by 9½ by 19½ inches, inside).

Table 1.—Typical eastern berry crates

Capacity and type	Inside dimensions (inches)	Length of slat
16 quarts, American 24 quarts, American 25	3½ by 13½ by 18 9 by 9 by 18 7½ by 11 by 22 11 by 11 by 22 14½ by 11 by 22 9 by 11 by 22	Inches 19½ 20 24 24 24 24

Table 2.—Typical western berry crates

Capacity	Inside dimensions (inches)	Length of slat
12 half pints	2%6 by 13½ by 18½	Inches 181/8 193/8 191/2

BRUSSELS SPROUTS

Brussels sprouts are shipped from California in 25-pound drums (fig. 23), although in 1948 some shipments were made in 12-ounce transparent bags, packed 24 to a wire-bound crate. In the East, brussels sprouts are commonly marketed in 1-quart berry cups, packed 16 or 24 to the crate.

CABBAGE 6

Late cabbage is usually largely shipped in bulk or bags, although some deliveries are made in crates and baskets. In the early season

 $^{^6}$ U. S. Dept. Agr. Farmers' Bul. 1423, Preparation of Cabbage for Market, gives additional facts concerning cabbage containers.

producing areas practically all cabbage is packaged, much of it in

50-pound mesh bags (fig. 24).

In the past many different sizes and shapes of crates have been used for cabbage. That is largely true today, but the crates are quite different. At one time the diversity of sizes was attributed to attempts by shippers to pack a certain weight of cabbage, and since the weight varies appreciably with the looseness or compactness of the heads, the custom resulted in numerous sizes of crates, some of barrel size, others of 100-pound capacity. These large, cumbersome sizes are no longer



PMA 18257

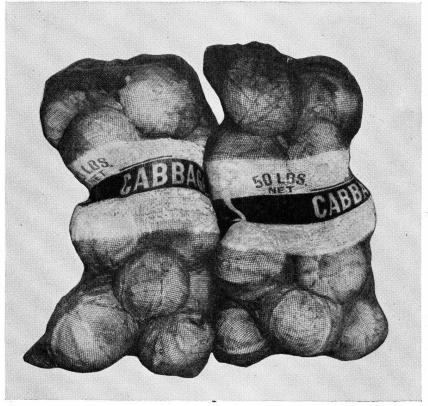
Figure 23.—Drum, constructed of rotary cut veneer and commonly used for shipments of brussels sprouts from California.

used, but the diversity of cabbage crate sizes still remains except in California, where only the L. A. crate is used. This crate, which holds around 80 pounds of cabbage, is used to some extent in all commercial producing sections, and it is the only crate common to all sections. Typical dimensions are 13 by 18 by 21% inches, inside.

No less than five other sizes are reportedly used in the Southwest, including the half L. A. crate (9 by 13 by 22 inches, inside) (fig. 49), a crate comparable in size with the standard cantaloup crate (12 by 12 by 22½ inches, inside), and a crate comparable in size with the jumbo

cataloup crate (13 by 13 by 22½ inches, inside). The latter two are used also in the Southeast. The jumbo size is usually wire-bound and holds about 50 pounds of cabbage. The weights reported in the standard size range from 45 to 50 pounds, and it would seem that one of the two sizes would be adequate for all practical purposes. The jumbo crate appears to be gaining favor in the Southeast sections.

For distribution outside the immediate area, eastern New York and Long Island shippers use either the so-called Long Island cauliflower crate or the so-called Catskill crate (13 by 151/8 by 23, and 14 by 12 by



PMA 18251

FIGURE 24.—Typical 50-pound open mesh bags of cabbage.

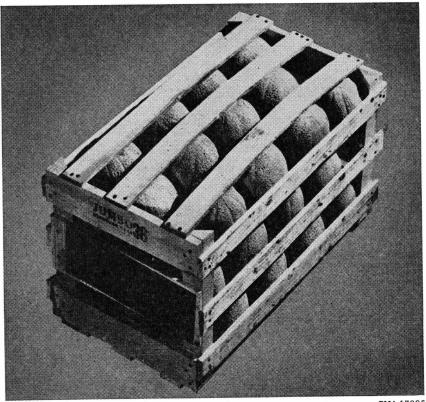
22 inches, respectively, inside measurements). One or the other of these two crates would seem to be superfluous. The Marietta section of Ohio ships cabbage largely in reused wire-bound citrus crates (12 by 12 by 24 inches, inside), and this container and reused L. A. crates and cantaloup crates are widely used by local growers supplying eastern markets.

CANTALOUPS AND MELONS

Over three-fourths of the carlot shipments of cantaloups, honeyball, and honeydew melons originate in Arizona, California, and Colorado.

The crates (figs. 25 and 26) used in these areas are designed to hold certain standardized packs of melons and their use has spread to other sections. The sizes generally used in the West are standardized by law in the States named except as noted in tables 3 and 4. The standardized packs shown in the tables are those prescribed in the Arizona law and differ but slightly from those prescribed in the other two States.

Persian, Casaba, and Cranshaw melons, produced chiefly in California, are shipped in honeydew crates and in various sizes of special crates. Two common sizes of the latter have inside dimensions of 63/4



PMA 17905

Figure 25.—Western-type cantaloup crate. Bulging top slats indicate a heavy pack, often resulting in bruised or slat-cut melons at destination.

by 12 by 221% and 734 by 14 by 221% inches, inside, but larger sizes up to

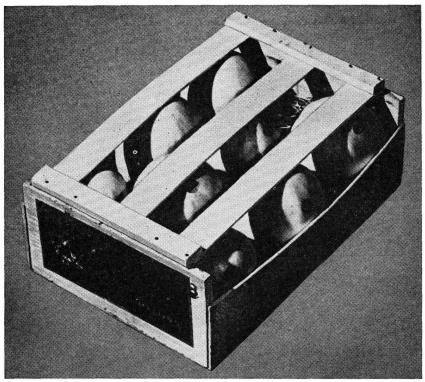
11 inches in depth are sometimes required.

Except in North Carolina and South Carolina, the sizes of crates used for cantaloups in eastern producing sections are almost too numerous to tablulate. Two crates predominate in the Carolinas: The standard (12 by 12 by 22½ inches) and the two-thirds crate (8 by 12 by 22 inches). A few jumbo crates (13 by 13 by 22½ inches) are used in South Carolina. Elsewhere in the East the crates are made to fit the melons. In Maryland and Delaware the full-size crates are normally packed with 36 melons, the two-thirds crates with 24 melons, and the

flats with 12 melons. The crate ends range from 12 to 14 inches square and the slats from 22 to 26 inches in length. The ends of the two-thirds crates are usually 8 by 12, $9\frac{1}{2}$ by 14, or 10 by 15 inches, and the slats 24 or 26 inches in length. Flats are made with ends 5 by 15, $5\frac{1}{2}$ by $16\frac{1}{2}$, and 6 by 18 inches, the slats ranging from 22 to 30 inches long.

Neither flats nor two-thirds crates are used in Michigan. The crates used are made with ends 9, 10, 11, or 12 inches square and slats from 22 to 26 inches in length. In all eastern sections many 1-bushel tub

baskets and 1-bushel hampers are used for melons.



PMA 17906

FIGURE 26.—Western-type honeydew crate. Note bulging side slat due to packing oversized melons, which often arrive at retail stores in bruised condition.

One of the reasons given for the multiplicity of eastern crate sizes is that many varieties are grown under natural conditions, without irrigation, under which conditions the size of melons cannot be controlled; but the principal reason would seem to be the habitual practice of packing always the same number of melons to the crate, instead of varying the count to fit a few standard sizes of crates, as is done in the West. The latter is believed to be the more advantageous method, not only from the standpoint of more economical manufacturing and handling, but also in providing a more definite basis of buying and selling, since there is less uncertainty as to what is meant by the terms "pony," "standard," and "jumbo" crates. On the other

hand, western packs are not always entirely satisfactory. Too often shipments arrive in eastern markets showing severe bruising and slat cuts believed to be wholly attributable to the practice of packing melons that are somewhat too large for the package, resulting in bulging on all four sides of the crates.

Table 3.—Western cantaloup crates

Crate designation	Inside dimensions ¹ (inches)	Standard packs of melons
Pony flat	4 by 12 by 22½	8 to 12

¹ Outside length for all sizes, 23½ inches.

² California standard flat is 13½ inches wide, inside.

³ Not standard in Colorado.

Table 4.—Western honeydew crates

Crate designation	Inside dimensions (inches)	Standard packs of melons
Standard crate Jumbo crate	1 6¾ by 16 by 22½	Number 9, 12 6, 8

 $^{^1}$ Arizona and Colorado prescribe depths of $6 \frac{1}{2}$ and $7 \frac{1}{2}$ inches and widths of $16 \frac{1}{4}$ inches.

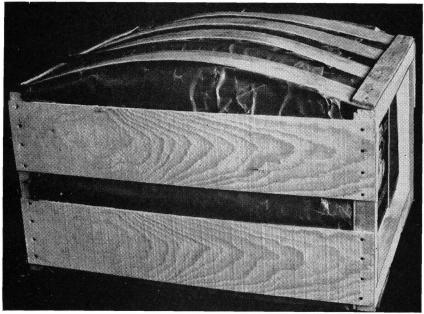
CARROTS 7

California normally supplies about half, and Arizona and Texas each about one-fifth of the bunched carrots shipped by rail. One principal type of container is used in these areas, namely, the L. A. crate which, as standardized by California law, measures 13 by 18 by 215% inches, or 13 by 17½ by 215% inches, or 13¾ by 17½ by 215% inches, inside measurement (fig. 27). The usual pack has ranged from 4 to 6 dozen bunches, depending upon the size of the carrots, and the crates were usually packed with an appreciable bulge. However, in 1948 the railroads initiated regulations designed to limit the amount of bulge to be permitted on crates of carrots shipped by rail, and this may necessitate some change in packing practices.

Topped carrots from these areas are commonly shipped in 50-pound mesh sacks, but occasionally crates are used. In New York

⁷U. S. Dept. Agr. Farmers' Bul. 1594, Preparation of Bunched Beets, Carrots, and Turnips for Market, gives additional facts concerning carrot containers.

the 1-bushel tub basket is used extensively, and in Ohio and Pennsylvania, the 16- and 24-quart splint baskets. The prepacking of topped carrots in 1-pound transparent sacks has met with favorable consumer acceptance and this method of merchandising carrots is increasing. Seventy-two such bags may be shipped in the L. A. crate mentioned above.



PMA 30112

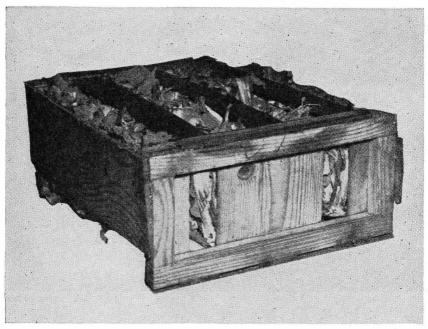
Figure 27.—So-called Los Angeles or L. A. crate packed with bunched carrots. When shipped by rail the bulge and girth at point of largest measurement may not exceed certain maximums prescribed by the carriers.

CAULIFLOWER

Because of its nature, cauliflower is generally shipped in crates, although growers supplying nearby markets sometimes use bushel baskets and other miscellaneous containers. The crate standardized by California law (fig. 28) in 1933 is now quite generally used in all western districts, although in Oregon and Washington minor variations in dimensions have been observed. The standard California crate, sometimes referred to as the pony crate, is usually packed with from 8 to 15 heads as normally trimmed. It also is used for bunched broccoli.

The crate used for Long Island cauliflower, the so-called Long Island crate, has inside dimensions of 13 by 15½ by 23 inches, and is now usually wire-bound. Elsewhere in New York, the so-called Catskill crate is used in somewhat varying sizes. Typically inside dimensions are 14 by 12 by 22 inches. Both crates are used to some extent for cabbage.

The marketing and distribution of cauliflower involve an exceptional amount of waste because, as ordinarily trimmed, a relatively small part of the product is edible. Some experimental shipments of more severely trimmed heads, wrapped in film or waxed parchment paper and packed up to 24 heads per crate, have been made from California, but this method has not become common practice. Some progress has been made in the prepackaging of cauliflower segments in consumer units after arrival in the terminal markets.



PMA 17916

FIGURE 28.—Western-type pony cauliflower crate; also used for broccoli.

CELERY

For many years there was a generally prevailing idea that more or less especially designed containers were required for the celery grown in different sections, and almost countless different sizes and types of containers have been used. At one time it was frequently possible to identify the State from which celery was shipped merely from the conformation of the package, but such identification is more difficult today as packing practices become more nearly uniform in the principal producing areas. These areas are California, Florida, Utah, New York, and Michigan, which in 1948, shipped 23,943 of the 24,902 carloads shipped by rail in the United States.

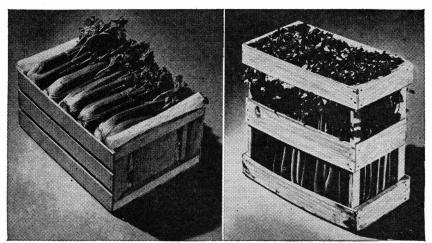
Today, much of the celery, wherever grown for general distribution, is clipped to 16 inches in length and packed with tops and butts reversed in alternate layers, thus effecting appreciable economies in transportation and handling costs as compared with celery packed with full tops. Another advantage is that celery prepared in this manner requires little if any additional trimming at destination.

It should be observed, however, that unlike celery packed upright with full tops, clipped celery packed flat is susceptible to damage from

pressure packing.

The crate most generally used for clipped celery has become virtually standard throughout all important producing sections. The inside dimensions are generally 93/4 by 16 by 20 inches, with some slight variations in length as between the nailed and wire-bound types (fig. 29).

The crates used for full-top celery vary somewhat with the producing areas. In the West, the so-called half-crate is uniformly 11 inches wide and 20% inches long, inside, and usually 20 inches in depth (fig. 29). However, a few crates 16 and 18 inches in depth are sometimes used in California and crates 22 and 24 inches in depth are sometimes used in Oregon. In Michigan two crates of this kind



PMA 17907

Figure 29.—Western-type celery crates. Left, nailed-type crate used for clipped celery. Wire-bound crates of similar dimensions are also used for clipped celery in California and other producing areas. Right, half crate.

are used; one is designated a "half-crate," and the other the "double-hi-ball." The inside dimensions are 20 by 10 by 20 and 20 by 10 by 16 inches, respectively. A half-crate observed in New York in 1948 was very similar to the western half-crate. Some rough, unwashed New York celery is shipped to distribution points in a so-called field crate, or two-thirds crate, the dimensions of which are 22 by 16 by 21 inches, inside.

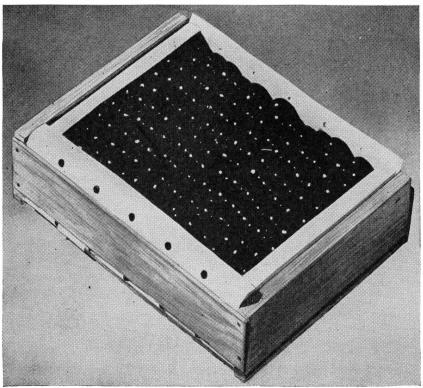
Some prepackaging of celery is done in all producing sections, but the number and size of the stalks is by no means uniform and the carrier crates vary accordingly. Film bags, trays overwrapped with

film, and film wraps are used.

In certain sections of Michigan considerable celery is marketed in bunches of 12 stalks without benefit of any package. This method appears to be suitable for truck shipment to nearby retail outlets where excessive handling is not involved. In other sections of Michigan a certain amount of celery is stored in trenches in the field and worked out during the fall and winter months. When trimmed and washed, such celery is relatively small in size, much like celery hearts, and is customarily packed in squares or flats. The former are uniformly 8 inches square at the ends but sometimes vary in length from 10 to 16 inches. Typical Michigan flats are 5½ by 10½ by 17 inches, inside. This type of operation appears to be diminishing.

CHERRIES

Eastern fresh cherries are usually shipped in 16- or 24-quart berry crates or in 4- or 12-quart Climax baskets. In the West boxes are



PMA 17908

Figure 30.—California standard cherry box, the so-called Campbell lug, holding 15 to 16 pounds of cherries, the first two layers of which are usually row-packed.

chiefly used. In 1948 California, Washington, Utah, and Idaho shipped 1,532 of the 1,718 carloads of cherries shipped by rail in this country.

There has been and is much confusion as to the sizes of boxes used for cherries, and the standards promulgated by the several States from time to time have thrown little light on the situation because of their multiplicity and lack of uniformity, and because in so many instances boxes other than those of the prescribed standards have been used. Various reasons are sometimes given for the persistent

use of numerous varying sizes of cherry containers, but the desire of shippers to use distinctive packages and to pack varying weights of

fruit would appear to be the main reasons.

Two boxes, both standardized by State law, are chiefly used in California. One is the so-called Campbell lug, the inside dimensions of which are 4½ by 11½ by 14½ inches (fig. 30); the other is the so-called Calex lug, measuring 3¾ by 13½ by 16½ inches, inside. The former is row-packed and delivers between 15 and 16 pounds of cherries. The Calex lug is "bunch" faced and contains about 18 pounds of fruit. Some California cherries are shipped in 1-pint cups packed 12 to a flat crate, and some are sold in ½- and 1-pound transparent film bags. The L. A. lug (5¾ by 13½ by 16⅓ inches, inside), holding between 25 and 30 pounds, is used for intrastate shipments.

In Washington, the boxes used for cherries are largely those used for apricots, the inside dimensions being 35% by 10½ by 15 and 4 by 10½ by 14 inches. Each contains about 13½ pounds of cherries. The former, and a 20-pound box, measuring 5 by 11½ by 16 inches, are used in Montana. Twelve- and thirteen-pound boxes of varying

dimensions are reported in use in Utah.

CITRUS FRUIT 8

At one time there were only two citrus fruit boxes in common use, the California box, holding approximately 1½ bushels and the Florida box, holding 1¾ bushels. The former is standardized by law in Arizona and California, and the latter in Texas and Florida. Practically all shipments of oranges and grapefruit from California and Arizona are made in the standard 2-compartment box, the inside dimensions of which are 11½ by 11½ by 24 inches. (Fig. 31.) In Florida and Texas the standard 2-compartment box measures 12 by 12 by 24 inches, inside, but in both States, this box has been largely superseded by a 1-compartment box of the same inside dimensions. Practically all of the latter are wire-bound, except in Texas where a nailed type is favored (fig. 32).

The use of mesh sacks for oranges and grapefruit has increased in recent years, and the sizes reflect the difference in size as between the California and Florida types of boxes. The consumer-size sack used in California holds 7 pounds, while in Texas and Florida an 8-pound sack is commonly, although not always, used, and the carrier crates holding 10 sacks vary accordingly. The wire-bound carrier used in California measures 13 by 14 by 24½ inches, and a similar crate used in Florida measures 16 by 13 by 24 inches, inside. This crate accommodates sixteen 5-pound bags. Both Florida and Texas ship appreciable quantities of oranges and grapefruit in quarter and

half-box sacks, either mesh or solid paper.

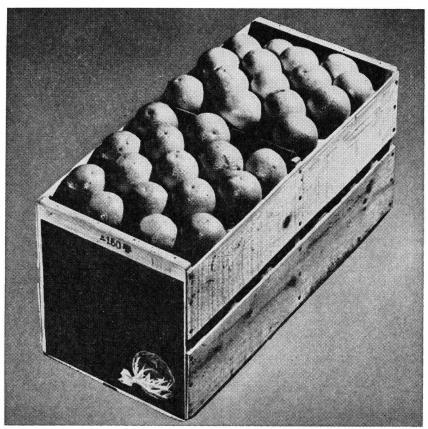
Practically all domestic lemons originate in California and are shipped in the California standard lemon box, the inside dimensions of which are 9% by 13 by 25 inches. Small sizes of lemons are sometimes put up in 2-pound transparent film bags and packed 36 to the carrier crate mentioned above.

The tangerines produced in Florida and Texas are shipped largely in a nailed or wire-bound half box measuring 9½ by 9½ by 19½ inches,

⁸U. S. Dept. Agr. Farmers' Bul. 1763, Harvesting and Handling of Citrus Fruits in the Gulf States, gives additional facts concerning citrus fruit containers.

inside (fig. 32), although a newer style box of the same capacity has become popular in Florida. It measures 7½ by 12 by 19½ inches, inside. The half strap (6 by 12 by 24 inches, inside), also is sparingly used.

There is much diversity in the containers used for limes. All producing areas use varying sizes of fiberboard boxes but two that seem to predominate in Florida measure 3¾ by 11½ by 14 inches, and 3½ by 10 by 12½ inches, inside. Many limes are shipped from Florida in a wooden quarter box, 6 by 12 by 12 inches, inside.



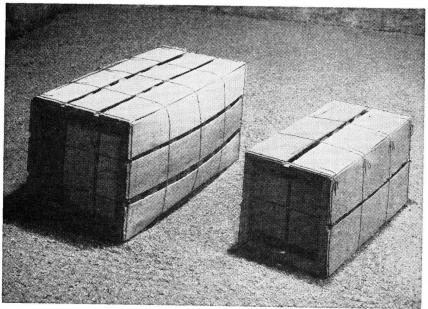
PMA 17909

FIGURE 31.—Standard California-Arizona 2-compartment orange and grapefruit box.

For kumquats, Florida shippers used two styles of half boxes: 9½ by 9½ by 19½ and 6 by 12 by 24 inches, inside, and a quarter box 7¾ by 7¾ by 14½ inches, inside. The 1-bushel tub basket also is used.

CORN (GREEN)

The commercial methods of handling green corn have changed materially during the past 2 decades. Local market gardeners continue to use burlap and mesh bags holding from 4 to 6 dozen ears, and



PMG 17671

FIGURE 32.—Wire-bound 1-compartment citrus crates, used in Florida and Texas. Left, box size; right, half-box size. Standard 2-compartment boxes of both sizes are used to some extent in both States.



FIGURE 33.—Partly unloaded car of green corn in open-mesh sacks.

some shipments over longer distances are still made in this manner, but for the most part containers of quite different types are used. In New Jersey and Pennsylvania many 1-bushel tub baskets of the ventilated type are used; these are quite similar to the baskets once used for Texas shipments. On the other hand, Texas and other Southern States, such as Louisiana, Alabama, and Florida, now use a special type open-mesh sack holding 5 dozen ears. When this bag is used, the ears are trimmed to uniform length, promptly precooled, placed-packed in the bags, and shipped under top ice (fig. 33).

In California a wire-bound crate (73/4 by 14 by 22 inches, inside), was used almost exclusively for green corn in 1948. A similar crate, widely used in Florida, measures 9 by 11 by 21% inches, inside. Each

delivers about 5 dozen ears.

The packing of green corn in consumer units has met with considerable initial success. In this process the ears are completely husked, promptly precooled, and then packed 3 to 6 ears to a tray that is overwrapped with transparent film. The trays vary in size but are usually packed 12 or 24 to a fiberboard box and kept under constant low temperature. Typical dimensions of a box holding 12 trays are 7 by 11½ by 11½ inches, and for 24 trays, 3¼ by 21 by 22½ inches, inside.

CRANBERRIES

In 1915 practically all cranberries produced in the United States were shipped in 100-pound barrels. By 1928 the barrel had been all but supplanted by so-called half-, quarter-, and eighth-barrel boxes. Ten years later only the quarter-barrel box was extensively used. Today most cranberries are put up in 1-pound transparent film bags or "window" cartons and packed 24 to the fiberboard box (fig. 34). The quarter-barrel boxes that are still in use differ slightly in dimensions, one being 9½ by 10½ by 15 inches, the other 9½ by 11 by $13^{15}/16$ inches, inside.

CUCUMBERS

Florida is by far the largest producer of slicing cucumbers, and although other containers are sometimes used, the 1-bushel solid bottom tub basket predominates in this and other commercial producing areas. In Ohio, Illinois, Indiana, and Michigan field-grown cucumbers are frequently marketed in 12-quart Climax baskets. Hothouse cucumbers are more often packed in wooden and fiberboard boxes of varying sizes to accommodate the usual pack of 1 dozen per container.

FIGS

Fresh figs from California are shipped in one-layer boxes in which fillers are used to provide a separate cell for each fruit. The number of cells varies with the size of the fruit, but the boxes are uniformly 1% inches deep, 11 inches wide, and 16½ inches long, inside. Shallow baskets having the same top dimensions as the square 3-quart till baskets used in the West are sometimes used. The baskets are packed with a single layer of fruit and shipped four to a crate, measuring 1% by 16 by 16½ inches, inside.



Figure 34.—Cranberries in 1-pound transparent sacks. 1-pound "window" cartons also are used.

GRAPES 9

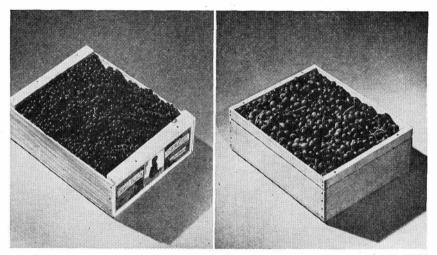
American-type grapes, produced chiefly in the East, Middle West, and Northwest, are commonly shipped in 4- and 12-quart Climax baskets, but shipments are not extensive. For fancy table grapes, a 2-quart till basket with wire overhandle, packed 8 or 12 to a carrier, is used to some extent.

⁹ U. S. Dept. Agr. Farmers' Bul. 1558, Preparation of Eastern Grapes for Market, gives additional facts concerning grape containers.

The greater part of the vinifera (European) grape crop is grown in California and is shipped chiefly in lug boxes, although some table stock is shipped in crates containing four 3-quart baskets or nine 1½-quart baskets. These crates are usually 4½ or 4¾ inches by 16 by 16⅓ inches, inside measurements.

To prolong the marketing season, certain varieties of vinifera grapes are sometimes packed in sawdust and placed in storage. Two sizes of grape chests are used for this purpose: One, holding about 22 pounds net weight of grapes, measures 7¾ by 13½ by 16⅓ inches, inside; the other, holding about 32 pounds net weight of fruit, measures 7¾ by 14⅓ by 18⅓ inches, inside. Both are standardized by California law.

The Agricultural Code of California provides for several sizes of lug boxes for grapes, including two for a so-called excelsior pack, in which the individual bunches are sometimes enclosed in "parchment"



PMA 17911

FIGURE 35.—Left, so-called L. A. lug box with grapes; right, "display" lug box of the same capacity. The upper part of the display lug may be removed with the cover to afford maximum display of the contents.

or transparent wraps and packed in a single layer surrounded with excelsior. The inside dimensions of these containers are 4½ by 15 by

 $22\frac{1}{8}$, and $5\frac{7}{8}$ by $11\frac{1}{2}$ by $16\frac{1}{2}$ inches, respectively.

The major part of the shipments of fresh grapes from California are usually made in one or the other of two principal lug boxes. For table stock, except from the desert areas, the L. A. lug (5¾ by 13½ by 16⅓ inches, inside), holding 28 pounds, net weight, is chiefly used. A smaller lug, 4¾ inches deep but identical in width and length and holding 24 to 26 pounds net weight, is used for a considerable portion of the grapes shipped from the Coachella and Imperial Valleys. Display lugs of the same dimensions are sometimes used. These are constructed with two-piece sides and ends, the upper pieces being entirely removed when the box is opened for display (fig. 35). Some shippers of table grapes use special lug boxes designed to provide a maximum of ventilation. One such container is wider at the top than at the bottom, the inside dimensions being 5¾ by 14½ (top) 10½

(bottom) by 161/8 inches. In another special type the ends are notched in the center, providing an inverted V-shaped tunnel extending the

full length of the container.

Juice grapes are normally packed in lug boxes and sold by weight. The conventional lugs referred to above are used. The smaller one delivers between 24 and 26 pounds net weight of grapes; the larger one, without cleats, delivers between 28 and 30 pounds. By using cleats 11/16 or 7/8 inch thick to increase the depth, the net weight per lug may be increased to 32 to 35 pounds, or in some instances to as much as 38 pounds.

LETTUCE

Shipments of lettuce by rail in the United States in 1948 totaled 74,119 carloads, of which 71,338 originated in California and Arizona. The two States with the next largest rail shipments were Idaho, 897 carloads, and Oregon, 616 carloads. Shipments of iceberg-type lettuce are increasing from Florida and Texas, which in 1948 shipped 542 carloads. As in the case of bunched carrots, one principal type of container is used in all of these States, namely, the L. A. crate, and the dimensions vary, as discussed in connection with bunched carrots (fig. 27). Iceberg lettuce is packed in layers, 4 to 6 dozen heads per crate, with crushed ice over each layer. For shipments during the summer months, as from Salinas, Calif., and elsewhere, the deeper crate (13¾ inches) is used as a means of utilizing a larger quantity of package ice. Lettuce and bunched vegetables shipped in these crates are often packed with an excessive bulge, and in 1948 the railroads initiated steps seeking to limit the amount of bulge to be permitted on crates offered for rail shipment.

Iceberg lettuce grown in New York and New Jersey is packed in two layers, usually without package ice, in a crate measuring 9 by 17 by 22 inches, inside. Big-Boston-type lettuce, produced in the same areas, also is packed in two layers, but the crate used measures 7½ by 16 by 19 inches, inside (fig. 36). In each instance, crates of slightly

different dimensions have been noted.

The popular package for leaf lettuce produced in Pennsylvania, Ohio, and Michigan is the 24-quart splint basket, which delivers about 10 pounds, net weight, of lettuce.

MUSHROOMS

In the Kennett Square district of Pennsylvania, the principal shipping container for mushrooms is the 4-quart Climax basket, holding 3 pounds of mushrooms. A special 1-pound Climax basket authorized for mushrooms by the Standard Container Act of 1916 has been only sparingly used. Elsewhere in commercial producing sections, mushrooms are commonly packed in ½-pint and 1-pint cups or in ½-pound and 1-pound cups or folding boxes, packed 8, 12, 16, or 24 to the carrier. Some 7-ounce boxes have been noted.

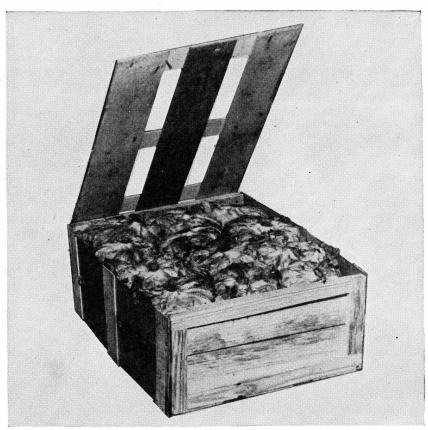
NECTARINES

As produced and shipped from California, nectarines are packed in California standard fruit boxes, 11½ inches wide and 16½ inches long, inside, and varying in depth from 4½ to 5¾ inches. Fillers are often used to separate the individual fruits (fig. 37).

Okra is commonly shipped by express in less-than-carload quantities and the most generally used containers are the ½-bushel hampers.

ONIONS

The 50-pound open-mesh sack has become the most generally used container for dry onions, and it is used in all sections where onions are



PMA 18249

FIGURE 36.—Eastern Big-Boston-type lettuce crate, very similar in size and construction to the Texas radish crate (fig. 42).

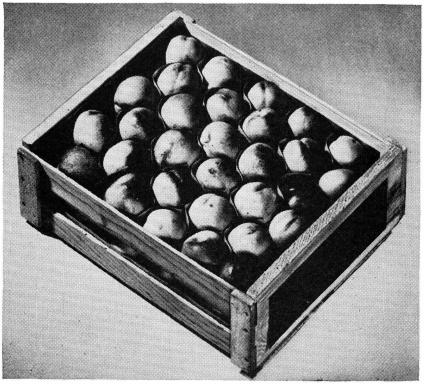
grown commercially (fig. 38). However, some 5-, 10-, and 25-pound sacks are used. For export, a wire-bound crate, measuring 13 by 13 by 25 inches, inside, and holding 90 pounds of onions, is reported in use in Oregon.

Bunched green onions and shallots are shipped from Louisiana in a 4-bushel barrel, holding 20 dozen bunches, and in a so-called 1½-bushel crate, holding 8 dozen bunches. The dimensions of the crate are: Depth 8½, top, 14 by 21½, bottom, 15 by 22½ inches, inside

measurements. A special crate, holding 15 dozen bunches of small onions or 10 dozen bunches of larger onions, is used in Washington. Its dimensions are 11 by 17½ by 23 inches, inside.

PEACHES 10

The flat boxes used for nectarines are commonly used for shipping California peaches (fig. 37). The width and length are uniformly 11½ by 16⅓ inches, inside, and the depth is usually 4½ inches but, as standardized by State law, it also may be 4, 4¼, 4¾, 5, or 5½ inches.



PMA 17912

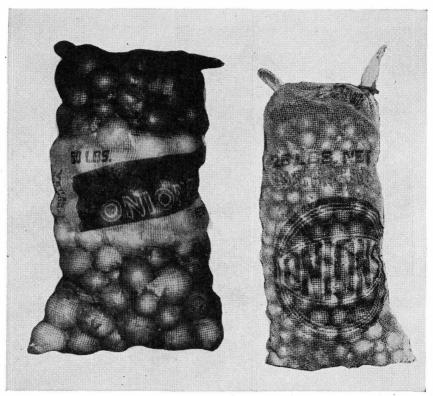
Figure 37.—Western-type fruit box, extensively used for peaches, nectarines, and similar western soft fruits.

The approximate net weight of peaches in these boxes, packed with from 35 to 105 fruits, is 18 pounds. The L. A. lug box (5¾ by 13½ by 16⅓ inches) holding about 23 pounds net weight of fruit, also is used. Both types of boxes are used in Oregon and Washington and to some extent in Utah and Colorado, but most of the peaches shipped from the latter two States and from Idaho are shipped in 1-bushel tub baskets, the type of container chiefly used in all eastern producing

¹⁰ U. S. Dept. Agr. Farmers' Bul. 1702, Preparing Peaches for Market, gives additional facts concerning peach containers.

sections. For early varieties and some portion of the late crops, ½-bushel tub baskets also are used. Packing with a minimum amount of bulge and four-point fastening of the covers is essential to the successful use of these containers for peaches. Various sizes and types of boxes, both nailed and wire-bound, are used to some extent for eastern peaches, but none has become generally adopted.

In New England and the North Atlantic States many peaches are marketed locally in the so-called peach basket which is actually the ½-bushel hamper as distinct from the round stave basket of this size.



PMA 18255

Figure 38.—Typical open-mesh bags used for onions, citrus fruits, cabbage, topped carrots, and similar products.

PEARS

Three States—California, Oregon and Washington—furnish most of the pears grown and shipped in the United States. The same container is universally used, namely, the northwestern pear box, the inside dimensions of which are 8½ by 11½ by 18 inches (fig. 39). It differs from the northwestern apple box only in depth. The packs range from 70 to 245 fruits per box and the net weight from 42 to 48 pounds. However, this quantity of fruit can be accommodated only by packing with an excessive bulge which, under pressure packing, frequently results in bruising and other damage, not always readily

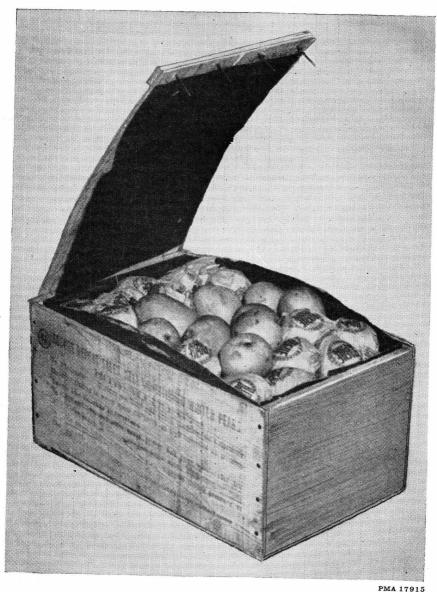


Figure 39.—Western pear box. Note paper shims at the top of the sides to protect the customary heavy bulge pack.

apparent upon casual inspection, but which comes to light when the boxes are unpacked in retail stores.

Another container used for western pears is the so-called one-way lug box, $7\frac{3}{16}$ by $13\frac{1}{2}$ by $20\frac{5}{8}$ inches, inside. The depth includes an $1\frac{1}{16}$ -inch cleat. This package delivers from 44 to 46 pounds of fruit and is sometimes shipped without a cover. In such instances, the cleat used is wider than the thickness of the end piece, so that the boxes,

when stacked one on another, may shift slightly without injuring the fruit beneath. For local distribution in the West, the L. A. lug box (5\% by 13\% by 16\% inches) is used.

Eastern pears are shipped almost exclusively in 1-bushel tub baskets.

PEAS

A few wire-bound boxes are reportedly used for green peas in Oregon and Washington, but for most interstate shipments from these and other Western States—California, Colorado, and Idaho, the States of largest production—the 1-bushel tub basket is used. These baskets are constructed to accommodate a flat cover that fits inside the staves, resting upon a recessed inside top hoop.

PEPPERS

The pepper crate used in California, and to some extent in Texas and Florida, has inside dimensions of 13% by 11 by 22 inches and a capacity of 1½ bushels. It is also used for eggplant, but has been largely supplanted for both products by the 1-bushel tub basket. In North Carolina, Virginia, and New Jersey the 1-bushel hamper is occasionally used for these products.

PINEAPPLES

One of the most satisfying developments of recent years from the standpoint of minimizing intransit damage is the introduction and extensive use of the half-pineapple crate, the inside dimensions of which are 10½ by 12 by 16½ inches. However, full-size, 2-compartment crates (10½ by 12 by 33 inches) are still used to some extent.

PLUMS AND PRUNES

Plums for the fresh market are produced chiefly in California where the fruit is carefully graded to size and packed and sold by count. Two types of containers are used for practically all interstate shipments. One of these is the 4-basket crate, which holds four 3-quart till baskets and varies in depth from 4 to 6 inches, depending upon the size of the fruit packed in them, the width and length being uniformly 16 and 16½ inches, respectively. The baskets are packed with from 44 to 85 plums, and the net weight varies from 22 to 29 pounds per crate (fig. 40).

The fruit boxes, also used, are of uniform width and length (11½ by 16½ inches), with depths ranging from 4 to 5½ inches. They hold from 75 to 105 fruits weighing about 18 pounds. The L. A. lug box (5¾ by 13½ by 16⅓ inches) is used for intrastate distribution.

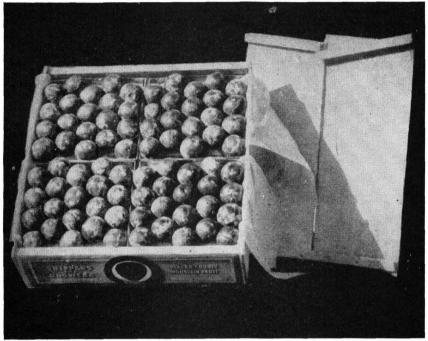
Eastern growers use various containers for shipping plums, usually the ½- or 1-bushel tub basket or the 4- and 12-quart Climax baskets.

Fresh prunes are produced and shipped chiefly from Idaho, Oregon, and Washington. The container used most generally is the ½-bushel tub basket, although flat boxes, similar to those used in Oregon and Washington for apricots and cherries, are occasionally used in those

States. A pyramid-type box, 81/4 inches deep, 101/2 inches wide at top, 8 inches wide at bottom, and 15 inches long, inside, holding about the same quantity as the basket, is used to some extent.

PERSIMMONS

Two boxes are commonly used for the persimmons shipped from California. The larger sizes are usually packed in a single layer flat box measuring 3½ by 11½ by 16⅓ inches, inside. Smaller sizes are packed in two layers in a box of the same width and length, but 4½



PMA 18244

Figure 40.—Standard California 4-basket crate used for shipping small fruits.

The baskets are of 3-quart capacity.

inches deep. The net weights are from 11 to 13 pounds for the single-layer packs, and about 18 pounds for the double-layer packs (fig. 41).

POMEGRANATES

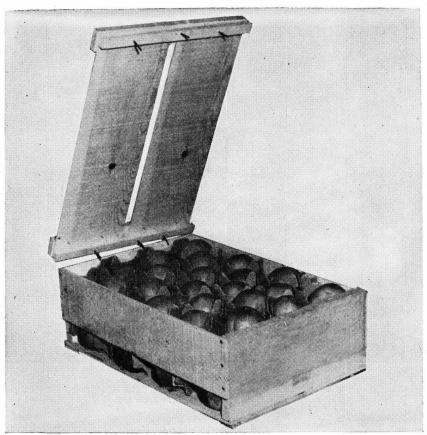
California pomegranates are shipped either in the L. A. lug box $(5\frac{3}{4} \text{ by } 13\frac{1}{2} \text{ by } 16\frac{1}{8} \text{ inches, inside})$ or the half-orange box $(5\frac{3}{4} \text{ by } 11\frac{1}{2} \text{ by } 24 \text{ inches, inside})$.

POTATOES

White potatoes, wherever produced in the United States, are now commonly shipped in burlap or solid paper sacks, mostly in the 100-

and 50-pound sizes. This is true for the early southern crops, which formerly were shipped almost altogether in barrels or crates, as well as for shipments from the late States, although Idaho ships some fancy baking potatoes in a box similar to the northwestern apple box.

A fairly large and apparently increasing volume of late potatoes is now put up in consumer-size units, usually 10- and 15-pound solid paper, cotton, or open-mesh bags, although some fiberboard boxes of these sizes are occasionally used. Many of the paper bags are now made with film or textile "windows," which afford the consumer a



PMA 18252

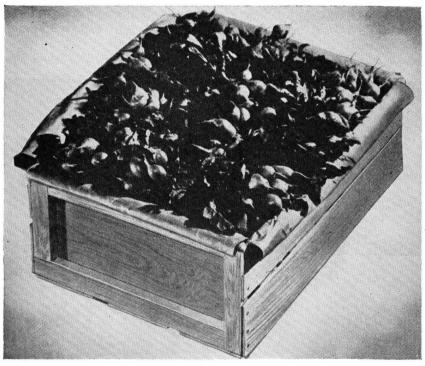
FIGURE 41.—Two-layer pack of persimmons in standard California fruit box.

limited opportunity to inspect the product before buying. A common criticism of closed consumer-size packages of potatoes has been the wide variation in the quality of the potatoes, quality which sometimes has been appreciably inferior to what the housewife believes she is entitled to expect.

RADISHES

The principal radish-producing areas for commercial distribution are located in Texas and South Carolina. A special radish crate,

used extensively in Texas and Arkansas, is almost indistinguishable from the crate used for Big-Boston-type lettuce, the inside dimensions being 7½ by 15 by 18¾ inches (fig. 42). But other containers also are used in Texas, including a small cauliflower crate (6 by 18 by 21½ inches) and a small vegetable crate (8 by 12 by 22 inches, inside). The usual pack of radishes in these crates is 85 or 90 bunches. The special radish crate is reportedly used in North Carolina and a wirebound half L. A. crate, in South Carolina. All sections employ the 1-bushel round stave basket and in Ohio and Pennsylvania 16- and 24-quart splint baskets are used.



PMA 17913

FIGURE 42.—Texas radish crate, very similar in size to eastern lettuce crate (fig. 36).

RHUBARB

Hothouse rhubarb produced at Sumner, Wash., is shipped largely in a flat box measuring 4 by 11½ by 18 inches, inside, and containing 15 pounds net weight of rhubarb. This box is used for shipping six 2-pound consumer-size folding boxes, measuring 2 by 3½ by 175% inches. Field-grown rhubarb produced in Washington is usually shipped in a box of the same width and length, but 6 inches deep, holding 20 pounds, net weight. In California, two 20-pound boxes are commonly used. One is the half artichoke box (4½ by 11 by 205%

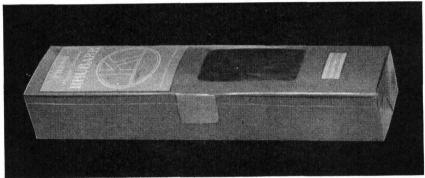
inches, inside); the other is a special rhubarb box, the dimensions of which are 3346 by 1142 by 2458 inches.

Michigan rhubarb is put up in 5-pound folding boxes, packed 10

to a fiberboard shipping case (fig. 43).

SPINACH

The spinach grown in Texas, Arkansas, and Oklahoma is shipped largely in more or less especially made 1-bushel round bottom "sheepnose" baskets, and this general type of package is used also in Virginia and other eastern producing sections. Crates are used in Colorado, Oregon, and Washington. The half L. A. crate (9 by 13 by 22 inches, inside), holding about 25 pounds net weight, is used in Colorado. A somewhat similar crate holding about 20 pounds, net weight, is used in Washington. The inside dimensions are 9½ by 16 by 18 inches. The L. A. crate is used in Oregon, chiefly for local purposes.



PMA 17934

FIGURE 43.—A 2-pound folding box for rhubarb.

Considerable spinach is now washed and otherwise prepared for immediate kitchen use and put up in transparent film bags, usually 10 ounces per bag, and shipped in carriers holding 12 to 24 bags. The carriers differ widely in dimensions.

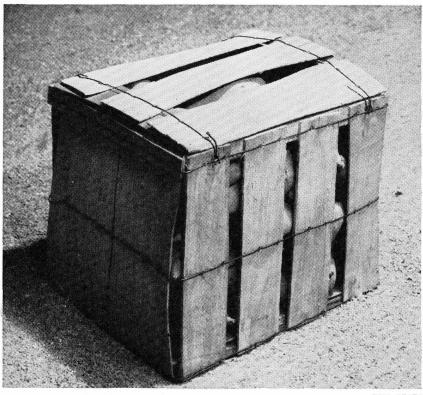
SWEETPOTATOES

By far the largest part of the carload shipments of sweetpotatoes in the United States originate in Louisiana. Of 7,940 carloads shipped in 1948, 5,760 were shipped from points within that State. The next largest producing State in terms of carlot shipments was Virginia, with 597 carloads.

A special wirebound crate, designed to provide a proper amount of ventilation, is now used in both States and to some extent in Tennessee and other eastern producing areas. As constructed, the outside width and length are the same, respectively, at top and bottom, but the upright end slats are attached in such manner that the inside length is somewhat larger at the bottom than at the top. The inside dimen-

sions are: Depth, 11\% inches; top, 13\% by 14\%₁₆ inches; bottom, 13\% by 16 inches. The crate delivers 50 pounds net weight (fig. 44).

Practically all other producing sections except New Jersey ship sweetpotatoes in 1-bushel tub baskets. New Jersey and, to some extent, Tennessee shippers use the 1-bushel hamper. For local distribution and immediate consumption, 50- and 100-pound burlap bags are more or less commonly used in all producing areas except California, where used apple and pear boxes are in use for this purpose.



PMA 17672

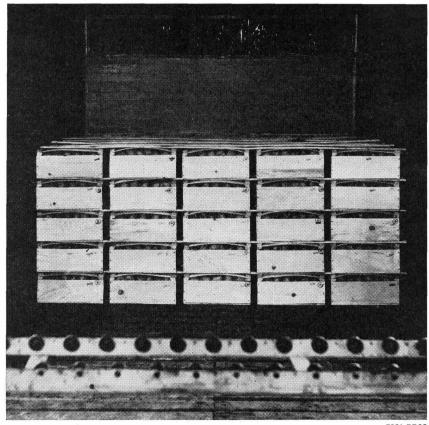
FIGURE 44.—A hybrid sweetpotato crate used in Louisiana and elsewhere, holding 50 pounds of sweetpotatoes. The term "hybrid" refers to the peculiar type of construction, the inside length being slightly larger at the bottom than at the top.

TOMATOES 11

Tomatoes for the fresh market are produced commercially in no less than 30 States, but by far the larger part of the annual carlot shipments originates in 3 States. In 1948, 24,730 carloads were shipped by rail from loading points in the United States, and of this amount, 20,179 were shipped from Texas, California, and Florida; 1,336 carloads originated in Tennessee, Pennsylvania, and Missis-

¹¹ U. S. Dept. Agr. Farmers' Bul. 1291, Preparation of Fresh Tomatoes for Market, gives additional facts concerning tomato containers.

sippi. In addition, the equivalent of 7,681 carloads were imported from Mexico. The tomatoes produced in the areas named are generally shipped green, so as to arrive at destination markets in a stage of maturity not too far advanced. In recent years the packing and shipping practices have become markedly uniform in all such producing areas. The container which is now being used in all sections is a lug box holding approximately 30 pounds, net weight, of tomatoes. The inside dimensions of this container are $6\frac{7}{16}$ by $13\frac{1}{2}$ by



PMA 7763

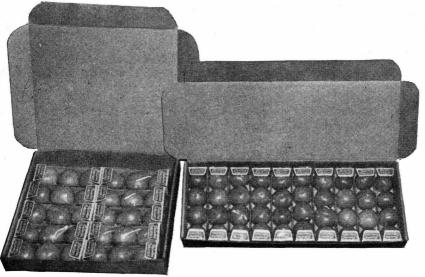
Figure 45.—L. A. lug boxes of tomatoes in partly loaded refrigerator car. Note the heavy cleats both under and over the ends of the cover, which tend to protect the bulge pack when the boxes are stacked.

16½ inches. The depth may include a cleat ½6-inch thick. The tomatoes are graded to standard sizes, wrapped, and packed in rows. The lug used in Florida and other southeastern areas differs slightly in inside depth and length, but is otherwise substantially the same as the western lug (fig. 45).

As received in the primary markets in varying stages of maturity, green tomatoes are processed to develop the proper merchandising maturity and are then repacked for distribution. Some are repacked

in the original lug box, and some in 10-pound units, but most of them are now put up in consumer units, cartonlike tubes or trays, holding 3 or 4 and sometimes 5 tomatoes of fairly uniform size, and packed in carriers holding 10, 20, or 30 units. A survey in 1948 disclosed numerous slightly varying sizes of consumer units and carriers used for tomatoes, of which the sizes shown in table 5 are typical and might be generally suitable (fig. 46). Some repackers use the lug box in which the tomatoes are received as a carrier for 20 consumer-unit packages.

More or less coincidental with the advances made in the prepackaging of tomatoes in terminal markets, and particularly during 1948, an appreciable volume of green tomatoes has been shipped, jumble-packed without wraps, in various sizes and types of bulk containers. One such crate delivers about 37½ pounds of tomatoes and is designed to function at destination as a carrier for 30 consumer units. The



PMA 15633

FIGURE 46.—Consumer packages of tomatoes. Left, carrier packed with 10 cartons of 3 tomatoes each; right, another style of carrier packed with 10 cartons of 4 tomatoes each, of approximately the same net weight.

inside dimensions of this container are $7\frac{1}{2}$ by 12 by 19 $\frac{1}{8}$ inches. Larger crates, holding about 60 pounds, also are used with apparent success. Typical dimensions of the larger crates are $11\frac{15}{16}$ by $11\frac{15}{16}$ by $18\frac{3}{4}$ inches and 10 by 11 by 22 inches, inside measurement.

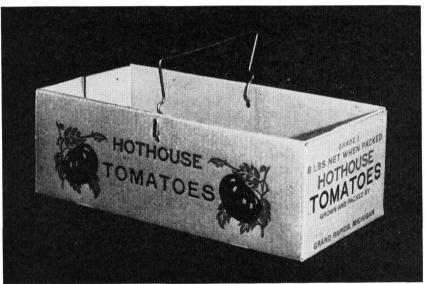
A considerable part of the tomatoes repacked at Atlanta, Ga., are packed in 20- and 40-pound nailed wooden boxes for distribution to nearby towns and cities. The inside dimensions of these boxes are quite uniformly 6 by 9 by 16 inches, and 8½ by 10½ by 20¾ inches, respectively. Similar sizes are used to some extent at Tampa, Fla.

Northern-grown tomatoes are usually marketed in the pink or ripe stage of maturity and various types and sizes of containers are used, including the 12-quart Climax basket, the ½- and 1-bushel tub baskets,

the 8-, 12-, and 16-quart splint baskets, and ½- and ½-bushel hampers. For nearby markets, ripe tomatoes in Oregon and Washington are sometimes packed in fruit boxes measuring 4½ by 11½ by 16⅓ inches, inside. Tomatoes grown in the Coachella and Imperial Valleys in California are often shipped in crates holding four 3-quart till baskets.

Hothouse tomatoes produced in the North Central States are commonly packed in 8-quart fiberboard baskets with overhandles similar to the square-braid splint basket of that size (fig. 47); and 8-, 12-, and 16-quart fiberboard and splint baskets are used for field-grown tomatoes in that section.

Tomatoes grown for processing in New Jersey, Delaware, Maryland, and Indiana are commonly transported in ½-bushel hampers,



PMA 18236

FIGURE 47.—An 8-quart fiberboard basket, extensively used for hothouse tomatoes.

although there is considerable use of boxes and crates holding approximately the same quantity. Boxes are used exclusively in California (fig. 48).

MISCELLANEOUS VEGETABLES 12

Bunched beets and turnips are shipped from Texas chiefly in the half L. A. crate (9 by 13 by 22 inches inside) (fig. 49), the usual pack being from 3 to 4 dozen bunches, and a similar crate of wire-bound construction is used in Florida, North Carolina, and South Carolina, but in the latter sections other containers, including the 1-bushel basket and hamper, also are used. Topped beets and turnips are usually shipped in 50-pound bags.

¹² U. S. Dept. Agr. Farmers' Bul. 1594, Preparation of Bunched Beets, Carrots, and Turnips for Market, gives additional facts concerning containers used for these vegetables.

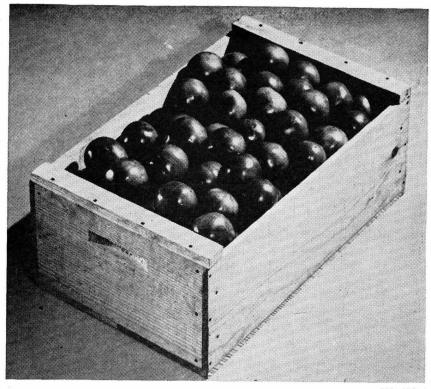


Figure 48.—A tomato field lug box used in California; inside dimensions 7% by 14 by $21\%_6$ inches.

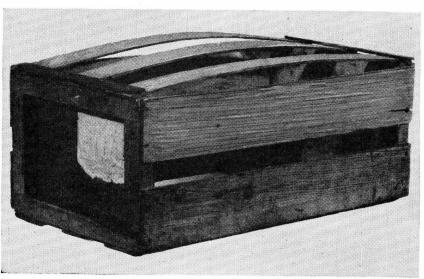


FIGURE 49.—A half L. A. crate.

PMA 17931

Considerable bunched parsley is shipped from Texas in a so-called small vegetable crate measuring 8 by 12 by 22 inches, inside. The

usual pack is 4 dozen bunches.

Leafy-type vegetables, such as endive, escarole, collards, kale, romaine, dandelion, dill, and mustard greens, are occasionally shipped in crates, but the container most commonly used is the 1-bushel round-bottom or tub basket. However, in Ohio, western New York, and Pennsylvania, the 12-, 16-, and 24-quart splint baskets are normally used for leafy and root-type vegetables, and growers supplying nearby northern markets commonly employ used L. A. crates, apple, and citrus fruit boxes.

Table 5.—Consumer units and carriers for tomatoes

Unit	Inside dimensions (inches) of—			
Consumer unit	10-unit carrier	20-unit carrier		
3 pack 4-5 pack	2 by 2% by 8 2 by 2% by 9%	2½ by 14 by 16½ 2¾ by 12¾ by 19½	5 by 14 by 16½. 4¾ by 12¾ by 19½.	

THE PROBLEM OF SIMPLIFYING AND STANDARDIZING CONTAINERS

The great diversity in the sizes and types of containers used for shipping fresh fruits and vegetables is coming to be more generally realized as search is made for possible ways of meeting the increasing costs of marketing these products, and of improving the efficiency of the distributive processes. Some of the diversity may be unavoidable because certain products require different types of packages and because in many instances manufacturers can readily supply certain kinds of containers and cannot readily supply other kinds. For various reasons it is not likely that in a country as large as the United States one specific container will be adopted for any given product.

But some reduction in the number of types and sizes of containers would seem to be possible. The vast interchange of fresh fruits and vegetables is acquainting the various shipping sections with the containers used in other sections and is likely to result in a more general adoption of those containers that appear to be best suited to the efficient marketing of given products. The almost universal use of the lug box for green-wrapped tomatoes and a similar widespread use of the L. A. crate for numerous products indicate the possibilities.

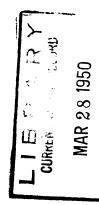
Certain products may require special containers but for the great mass of perishables moving in all directions across the country by rail and motortruck, reduction in container costs, economical handling, fair competition, proper accounting, and informative market reporting are contingent upon the use of a minimum number of wellestablished merchandising units.

The benefits accruing from the standardization of hampers, baskets, and barrels are generally recognized, and it is believed that the principle of simplification could be applied to other types of containers

with results equally advantageous to all concerned.

In this field, as in other lines of industry, simplification means reduction in waste through the elimination of unnecessary sizes, types, and dimensions of manufactured products. Moreover, in this field, where improvement in packages may be needed and changes are likely to occur as a result of marketing research or industry experimentation, the process of simplification is a continuing operation involving the progressive elimination of containers as they become obsolete or obsolescent, and the general adoption of those of proven worth. Such containers are the safest to use and are the least expensive.

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